



1

SEQUENCE LISTING

<110> LOOSMORE, SHEENA MAY
MINKE, JULES MAARTEN

<120> RECOMBINANT VACCINE AGAINST WEST NILE VIRUS

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<140> 10/714,781
<141> 2003-11-17

<150> 10/679,520
<151> 2003-10-06

<150> 10/374,953
<151> 2003-02-26

<150> 10/116,298
<151> 2002-04-04

<150> 60/281,923
<151> 2001-04-06

<150> 10/676,502
<151> 2003-09-30

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<160> 85

<170> PatentIn Ver. 3.2

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<210> 21

<211> 73

<212> DNA

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ttgaaaaagt aa 72

<210> 23

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oligonucleotide

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45

<210> 24

<211> 33

<212> DNA

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<210> 25
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oligonucleotide

<400> 25
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oligonucleotide

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<210> 27
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<210> 28
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<400> 28
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<210> 30
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<400> 30
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<210> 31
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<400> 31
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 ataattactc taa 73

<210> 32
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 acagattgt aa 72

<210> 33
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<400> 33

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<210> 34

<211> 95

<212> DNA

<213> Artificial Sequence

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<400> 34

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<210> 35

<211> 43

<212> DNA

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<400> 35

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<210> 36

<211> 58

<212> DNA

<213> Artificial Sequence

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<400> 36

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<210> 37

<211> 43

<212> DNA

<213> Artificial Sequence

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<400> 37
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<210> 38
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
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<400> 38
 gaagtggcca tcttcgtgca cggaccaact 30

<210> 39
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
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<400> 39
 agttggtccg tgcacgaaga tggccacttc 30

<210> 40
 <211> 30
 <212> DNA
 <213> West Nile virus

<220>
 <221> CDS
 <222> (1)..(30)

<400> 40
 gaa gtg gcc att ttt gtc cat gga cca act 30
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 1 5 10

<210> 41
 <211> 10
 <212> PRT
 <213> West Nile virus

<400> 41
 Glu Val Ala Ile Phe Val His Gly Pro Thr
 1 5 10

<210> 42
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<220>
 <221> CDS
 <222> (1)..(24)

<400> 42
 aag cct acc atc gat gtg aag atg 24
 Lys Pro Thr Ile Asp Val Lys Met
 1 5

<210> 43
 <211> 51
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 43
 gggccctcta gataaaaatt aagcgtgcac gttcacggag aggaagagca g 51

<210> 44
 <211> 51
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<220>
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 <222> (1)..(33)

<400> 44
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 Leu Leu Phe Leu Ser Val Asn Val His Ala
 1 5 10

<210> 45
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<223> Description of Artificial Sequence: Synthetic peptide

<400> 45

Leu Leu Phe Leu Ser Val Asn Val His Ala
1 5 10

<210> 46

<211> 8

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: Synthetic peptide

<400> 46

Lys Pro Thr Ile Asp Val Lys Met
1 5

<210> 47

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

/

<220>

<221> CDS

<222> (30)..(59)

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ggc ctg

Gly Leu

10

59

<210> 48

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

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24

<210> 49
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 1 5

24

<210> 50
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<223> Description of Artificial Sequence: Synthetic
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<400> 50
 Lys Pro Thr Ile Asp Val Lys Met
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<223> Description of Artificial Sequence: Synthetic
 peptide

<400> 51
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 1 5 10

<210> 52
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<220>
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<400> 53
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 tacgacatag tgataaatgc tatttcgcat cgttacataa agtcagttgg aaagatggat 420
 ttgacagatg taacttaata ggtgcaaaaa tgttaaataa cagcattcta tcggaagata 480
 ggataccagt tatattatac aaaaatcact gggttgataa aacagattct gcaatattcg 540
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Ala Ser Val	Gly Ala Val	Thr Leu Ser	Asn Phe Gln	Gly Lys Val	Met	
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atg acg gta	aat gct act	gac gtc aca	gat gtc atc	acg att cca	aca	1888
Met Thr Val	Asn Ala Thr	Asp Val Thr	Asp Val Ile	Thr Ile Pro	Thr	
	30	35		40		
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Ala Ala Gly	Lys Asn Leu	Cys Ile Val	Arg Ala Met	Asp Val Gly	Tyr	
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atg tgc gat	gat act atc	act tat gaa	tgc cca gtg	ctg tcg gct	ggc	1984
Met Cys Asp	Asp Thr Ile	Thr Tyr Glu	Cys Pro Val	Leu Ser Ala	Gly	
60		65	70		75	
aat gat cca	gaa gac atc	gac tgt tgg	tgc aca aag	tca gca gtc	tac	2032
Asn Asp Pro	Glu Asp Ile	Asp Cys Trp	Cys Thr Lys	Ser Ala Val	Tyr	
	80		85		90	
gtc agg tat	gga aga tgc	acc aag aca	cgc cac tca	aga cgc agt	cgg	2080
Val Arg Tyr	Gly Arg Cys	Thr Lys Thr	Arg His Ser	Arg Arg Ser	Arg	
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agg tca ctg	aca gtg cag	aca cac gga	gaa agc act	cta gcg aac	aag	2128
Arg Ser Leu	Thr Val Gln	Thr His Gly	Glu Ser Thr	Leu Ala Asn	Lys	
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aag ggg gct tgg atg gac agc acc aag gcc aca agg tat ttg gta aaa	2176
Lys Gly Ala Trp Met Asp Ser Thr Lys Ala Thr Arg Tyr Leu Val Lys	
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aca gaa tca tgg atc ttg agg aac cct gga tat gcc ctg gtg gca gcc	2224
Thr Glu Ser Trp Ile Leu Arg Asn Pro Gly Tyr Ala Leu Val Ala Ala	
140 145 150 155	
gtc att ggt tgg atg ctt ggg agc aac acc atg cag aga gtt gtg ttt	2272
Val Ile Gly Trp Met Leu Gly Ser Asn Thr Met Gln Arg Val Val Phe	
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gtc gtg cta ttg ctt ttg gtg gcc cca gct tac agc ttc aac tgc ctt	2320
Val Val Leu Leu Leu Leu Val Ala Pro Ala Tyr Ser Phe Asn Cys Leu	
175 180 185	
gga atg agc aac aga gac ttc ttg gaa gga gtg tct gga gca aca tgg	2368
Gly Met Ser Asn Arg Asp Phe Leu Glu Gly Val Ser Gly Ala Thr Trp	
190 195 200	
gtg gat ttg gtt ctc gaa ggc gac agc tgc gtg act atc atg tct aag	2416
Val Asp Leu Val Leu Glu Gly Asp Ser Cys Val Thr Ile Met Ser Lys	
205 210 215	
gac aag cct acc atc gat gtg aag atg atg aat atg gag gcg gcc aac	2464
Asp Lys Pro Thr Ile Asp Val Lys Met Met Asn Met Glu Ala Ala Asn	
220 225 230 235	
ctg gca gag gtc cgc agt tat tgc tat ttg gct acc gtc agc gat ctc	2512
Leu Ala Glu Val Arg Ser Tyr Cys Tyr Leu Ala Thr Val Ser Asp Leu	
240 245 250	
tcc acc aaa gct gcg tgc ccg acc atg gga gaa gct cac aat gac aaa	2560
Ser Thr Lys Ala Ala Cys Pro Thr Met Gly Glu Ala His Asn Asp Lys	
255 260 265	
cgt gct gac cca gct ttt gtg tgc aga caa gga gtg gtg gac agg ggc	2608
Arg Ala Asp Pro Ala Phe Val Cys Arg Gln Gly Val Val Asp Arg Gly	
270 275 280	
tgg ggc aac ggc tgc gga cta ttt ggc aaa gga agc att gac aca tgc	2656
Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Ile Asp Thr Cys	
285 290 295	
gcc aaa ttt gcc tgc tct acc aag gca ata gga aga acc atc ttg aaa	2704
Ala Lys Phe Ala Cys Ser Thr Lys Ala Ile Gly Arg Thr Ile Leu Lys	
300 305 310 315	
gag aat atc aag tac gaa gtg gcc atc ttc gtg cac gga cca act act	2752
Glu Asn Ile Lys Tyr Glu Val Ala Ile Phe Val His Gly Pro Thr Thr	
320 325 330	
gtg gag tcg cac gga aac tac tcc aca cag gtt gga gcc act cag gca	2800
Val Glu Ser His Gly Asn Tyr Ser Thr Gln Val Gly Ala Thr Gln Ala	
335 340 345	

ggg aga ttc agc atc act cct gcg gcg cct tca tac aca cta aag ctt	2848
Gly Arg Phe Ser Ile Thr Pro Ala Ala Pro Ser Tyr Thr Leu Lys Leu	
350 355 360	
gga gaa tat gga gag gtg aca gtg gac tgt gaa cca cgg tca ggg att	2896
Gly Glu Tyr Gly Glu Val Thr Val Asp Cys Glu Pro Arg Ser Gly Ile	
365 370 375	
gac acc aat gca tac tac gtg atg act gtt gga aca aag acg ttc ttg	2944
Asp Thr Asn Ala Tyr Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu	
380 385 390 395	
gtc cat cgt gag tgg ttc atg gac ctc aac ctc cct tgg agc agt gct	2992
Val His Arg Glu Trp Phe Met Asp Leu Asn Leu Pro Trp Ser Ser Ala	
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Gly Ser Thr Val Trp Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu	
415 420 425	
cca cac gcc acg aag cag tct gtg ata gca ttg ggc tca caa gag gga	3088
Pro His Ala Thr Lys Gln Ser Val Ile Ala Leu Gly Ser Gln Glu Gly	
430 435 440	
gct ctg cat caa gct ttg gct gga gcc att cct gtg gaa ttt tca agc	3136
Ala Leu His Gln Ala Leu Ala Gly Ala Ile Pro Val Glu Phe Ser Ser	
445 450 455	
aac act gtc aag ttg acg tcg ggt cat ttg aag tgt aga gtg aag atg	3184
Asn Thr Val Lys Leu Thr Ser Gly His Leu Lys Cys Arg Val Lys Met	
460 465 470 475	
gaa aaa ttg cag ttg aag gga aca acc tat ggc gtc tgt tca aag gct	3232
Glu Lys Leu Gln Leu Lys Gly Thr Thr Tyr Gly Val Cys Ser Lys Ala	
480 485 490	
ttc aag ttt ctt ggg act ccc gca gac aca ggt cac ggc act gtg gtg	3280
Phe Lys Phe Leu Gly Thr Pro Ala Asp Thr Gly His Gly Thr Val Val	
495 500 505	
ttg gaa ttg cag tac act ggc acg gat gga cct tgc aaa gtt cct atc	3328
Leu Glu Leu Gln Tyr Thr Gly Thr Asp Gly Pro Cys Lys Val Pro Ile	
510 515 520	
tcg tca gcg gct tca ttg aac gac cta acg cca gtg ggc aga ttg gtc	3376
Ser Ser Ala Ala Ser Leu Asn Asp Leu Thr Pro Val Gly Arg Leu Val	
525 530 535	
act gtc aac cct ttt gtt tca gtg gcc acg gcc aac gct aag gtc ctg	3424
Thr Val Asn Pro Phe Val Ser Val Ala Thr Ala Asn Ala Lys Val Leu	
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att gaa ttg gaa cca ccc ttt gga gac tca tac ata gtg gtg ggc aga	3472
Ile Glu Leu Glu Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg	
560 565 570	

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 Gly Glu Gln Gln Ile Asn His His Trp His Lys Ser Gly Ser Ser Ile
 575 580 585
 ggc aaa gcc ttt aca acc acc ctc aaa gga gcg cag aga cta gcc gct 3568
 Gly Lys Ala Phe Thr Thr Thr Leu Lys Gly Ala Gln Arg Leu Ala Ala
 590 595 600
 cta gga gac aca gct tgg gac ttt gga tca gtt gga ggg gtg ttc acc 3616
 Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr
 605 610 615
 tca gtt ggg aag gct gtc cat caa gtg ttc gga gga gca ttc cgc tca 3664
 Ser Val Gly Lys Ala Val His Gln Val Phe Gly Gly Ala Phe Arg Ser
 620 625 630 635
 ctg ttc gga ggc atg tcc tgg ata acg caa gga ttg ctg ggg gct ctc 3712
 Leu Phe Gly Gly Met Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu
 640 645 650
 ctg ttg tgg atg ggc atc aat gct cgt gat agg tcc ata gct ctc acg 3760
 Leu Leu Trp Met Gly Ile Asn Ala Arg Asp Arg Ser Ile Ala Leu Thr
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 ttt ctc gca gtt gga gga gtt ctg ctc ttc ctc tcc gtg aac gtg cac 3808
 Phe Leu Ala Val Gly Gly Val Leu Leu Phe Leu Ser Val Asn Val His
 670 675 680
 gct taatttttat ctagaatcga tcccgggttt ttatgactag ttaatcacgg 3861
 Ala
 ccgccttata aagatctaaa atgcataatt tctaaataat gaaaaaaagt acatcatgag 3921
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 ttcagatgat gttttagaaa agaaagttat tgaatatgaa aactttaatg aagatgaaga 4041
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<210> 55

<211> 684

<212> PRT

<213> West Nile virus

<400> 55

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 20 25 30

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Ile	Thr	Tyr	Glu	Cys	Pro	Val	Leu	Ser	Ala	Gly	Asn	Asp	Pro	Glu	Asp
65					70					75					80
Ile	Asp	Cys	Trp	Cys	Thr	Lys	Ser	Ala	Val	Tyr	Val	Arg	Tyr	Gly	Arg
				85					90					95	
Cys	Thr	Lys	Thr	Arg	His	Ser	Arg	Arg	Ser	Arg	Arg	Ser	Leu	Thr	Val
			100				105						110		
Gln	Thr	His	Gly	Glu	Ser	Thr	Leu	Ala	Asn	Lys	Lys	Gly	Ala	Trp	Met
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Asp	Ser	Thr	Lys	Ala	Thr	Arg	Tyr	Leu	Val	Lys	Thr	Glu	Ser	Trp	Ile
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Leu	Arg	Asn	Pro	Gly	Tyr	Ala	Leu	Val	Ala	Ala	Val	Ile	Gly	Trp	Met
145					150					155					160
Leu	Gly	Ser	Asn	Thr	Met	Gln	Arg	Val	Val	Phe	Val	Val	Leu	Leu	Leu
				165				170						175	
Leu	Val	Ala	Pro	Ala	Tyr	Ser	Phe	Asn	Cys	Leu	Gly	Met	Ser	Asn	Arg
			180					185					190		
Asp	Phe	Leu	Glu	Gly	Val	Ser	Gly	Ala	Thr	Trp	Val	Asp	Leu	Val	Leu
		195					200					205			
Glu	Gly	Asp	Ser	Cys	Val	Thr	Ile	Met	Ser	Lys	Asp	Lys	Pro	Thr	Ile
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Asp	Val	Lys	Met	Met	Asn	Met	Glu	Ala	Ala	Asn	Leu	Ala	Glu	Val	Arg
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Ser	Tyr	Cys	Tyr	Leu	Ala	Thr	Val	Ser	Asp	Leu	Ser	Thr	Lys	Ala	Ala
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Cys	Pro	Thr	Met	Gly	Glu	Ala	His	Asn	Asp	Lys	Arg	Ala	Asp	Pro	Ala
			260					265					270		
Phe	Val	Cys	Arg	Gln	Gly	Val	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly	Cys
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Gly	Leu	Phe	Gly	Lys	Gly	Ser	Ile	Asp	Thr	Cys	Ala	Lys	Phe	Ala	Cys
	290					295					300				
Ser	Thr	Lys	Ala	Ile	Gly	Arg	Thr	Ile	Leu	Lys	Glu	Asn	Ile	Lys	Tyr
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Glu	Val	Ala	Ile	Phe	Val	His	Gly	Pro	Thr	Thr	Val	Glu	Ser	His	Gly
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 Thr Pro Ala Ala Pro Ser Tyr Thr Leu Lys Leu Gly Glu Tyr Gly Glu
 355 360 365
 Val Thr Val Asp Cys Glu Pro Arg Ser Gly Ile Asp Thr Asn Ala Tyr
 370 375 380
 Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu Val His Arg Glu Trp
 385 390 395 400
 Phe Met Asp Leu Asn Leu Pro Trp Ser Ser Ala Gly Ser Thr Val Trp
 405 410 415
 Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu Pro His Ala Thr Lys
 420 425 430
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 Leu Ala Gly Ala Ile Pro Val Glu Phe Ser Ser Asn Thr Val Lys Leu
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 465 470 475 480
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 485 490 495
 Thr Pro Ala Asp Thr Gly His Gly Thr Val Val Leu Glu Leu Gln Tyr
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 Thr Gly Thr Asp Gly Pro Cys Lys Val Pro Ile Ser Ser Ala Ala Ser
 515 520 525
 Leu Asn Asp Leu Thr Pro Val Gly Arg Leu Val Thr Val Asn Pro Phe
 530 535 540
 Val Ser Val Ala Thr Ala Asn Ala Lys Val Leu Ile Glu Leu Glu Pro
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 Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg Gly Glu Gln Gln Ile
 565 570 575
 Asn His His Trp His Lys Ser Gly Ser Ser Ile Gly Lys Ala Phe Thr
 580 585 590
 Thr Thr Leu Lys Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala
 595 600 605
 Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr Ser Val Gly Lys Ala
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 Val His Gln Val Phe Gly Gly Ala Phe Arg Ser Leu Phe Gly Gly Met
 625 630 635 640

Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu Leu Leu Trp Met Gly
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Gly Val Leu Leu Phe Leu Ser Val Asn Val His Ala
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 <211> 5109
 <212> DNA
 <213> West Nile virus

<220>
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 catgcgctct tccgatgaga tattcgatgc ttttctaatag tatcatatag ctacaagata 180
 tgcctatcat gatgatgata tatatctaca aatagtgtta tattattcta ataatacaaaa 240
 tgttatatct tatattacga aaaataaata cgttaagtat ataagaaata aaactagaga 300
 cgatattcat aaagtaaaaa tattagctct agaagacttt acaacggaag aaatatattg 360
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 accaatgaag gaggacgact catcaaacat aaataacatt cacggaaaat attcagtatc 480
 agatttatca caagatgatt atgttattga atgtatagac ggatcttttg attcgatcaa 540
 gtatagagat ataaagggtta taataatgaa gaataacggt tacgttaatt gtagtaaatt 600
 atgtaaaatg cggaataaat acttttctag atggttgcgt ctttctactt ctaaagcatt 660
 attagacatt tacaataata agtcagtaga taatgctatt gttaaagtct atggtaaagg 720
 taagaaactt attataacag gattttatct caaacaaaat atgatacgtt atgttattga 780
 gtggataggg gatgatttta caaacgatat atacaaaatg attaatcttct ataatgcgtt 840
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 ctgtggtcta tatatactac accctaccga tattaaccaa cgagtttctc acaagaaaac 1020
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 catatgcata gaagaaataa acaaaaaaca tttttccgaa cagtattttg gaattctccc 1140

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ccgttaagtt tgtatcgta atg acc gga att gca gtc atg att ggc ctg atc 1672
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gcc agc gta gga gcg gtt acc ctc tct aac ttc caa ggg aag gtg atg 1720
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atg acg gta aat gct act gac gtc aca gat gtc atc acg att cca aca 1768
Met Thr Val Asn Ala Thr Asp Val Thr Asp Val Ile Thr Ile Pro Thr
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gct gct gga aag aac cta tgc att gtc aga gca atg gat gtg gga tac 1816
Ala Ala Gly Lys Asn Leu Cys Ile Val Arg Ala Met Asp Val Gly Tyr
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Met Cys Asp Asp Thr Ile Thr Tyr Glu Cys Pro Val Leu Ser Ala Gly
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aat gat cca gaa gac atc gac tgt tgg tgc aca aag tca gca gtc tac 1912
Asn Asp Pro Glu Asp Ile Asp Cys Trp Cys Thr Lys Ser Ala Val Tyr
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gtc agg tat gga aga tgc acc aag aca cgc cac tca aga cgc agt cgg 1960
Val Arg Tyr Gly Arg Cys Thr Lys Thr Arg His Ser Arg Arg Ser Arg
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agg tca ctg aca gtg cag aca cac gga gaa agc act cta gcg aac aag 2008
Arg Ser Leu Thr Val Gln Thr His Gly Glu Ser Thr Leu Ala Asn Lys
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aag ggg gct tgg atg gac agc acc aag gcc aca agg tat ttg gta aaa 2056
Lys Gly Ala Trp Met Asp Ser Thr Lys Ala Thr Arg Tyr Leu Val Lys
                  125                      130                      135

aca gaa tca tgg atc ttg agg aac cct gga tat gcc ctg gtg gca gcc 2104
Thr Glu Ser Trp Ile Leu Arg Asn Pro Gly Tyr Ala Leu Val Ala Ala
                  140                      145                      150                      155

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Val Val Leu Leu Leu Val Ala Pro Ala Tyr Ser Phe Asn Cys Leu	
175 180 185	
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Gly Met Ser Asn Arg Asp Phe Leu Glu Gly Val Ser Gly Ala Thr Trp	
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Val Asp Leu Val Leu Glu Gly Asp Ser Cys Val Thr Ile Met Ser Lys	
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Asp Lys Pro Thr Ile Asp Val Lys Met Met Asn Met Glu Ala Ala Asn	
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Leu Ala Glu Val Arg Ser Tyr Cys Tyr Leu Ala Thr Val Ser Asp Leu	
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Ser Thr Lys Ala Ala Cys Pro Thr Met Gly Glu Ala His Asn Asp Lys	
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Arg Ala Asp Pro Ala Phe Val Cys Arg Gln Gly Val Val Asp Arg Gly	
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Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser Ile Asp Thr Cys	
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Ala Lys Phe Ala Cys Ser Thr Lys Ala Ile Gly Arg Thr Ile Leu Lys	
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Glu Asn Ile Lys Tyr Glu Val Ala Ile Phe Val His Gly Pro Thr Thr	
320 325 330	
gtg gag tcg cac gga aac tac tcc aca cag gtt gga gcc act cag gca	2680
Val Glu Ser His Gly Asn Tyr Ser Thr Gln Val Gly Ala Thr Gln Ala	
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Gly Arg Phe Ser Ile Thr Pro Ala Ala Pro Ser Tyr Thr Leu Lys Leu	
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Gly Glu Tyr Gly Glu Val Thr Val Asp Cys Glu Pro Arg Ser Gly Ile	
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Asp Thr Asn Ala Tyr Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu	
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Gly Ser Thr Val Trp Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu	
415 420 425	
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Pro His Ala Thr Lys Gln Ser Val Ile Ala Leu Gly Ser Gln Glu Gly	
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Asn Thr Val Lys Leu Thr Ser Gly His Leu Lys Cys Arg Val Lys Met	
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Phe Lys Phe Leu Gly Thr Pro Ala Asp Thr Gly His Gly Thr Val Val	
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Ser Ser Ala Ala Ser Leu Asn Asp Leu Thr Pro Val Gly Arg Leu Val	
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Thr Val Asn Pro Phe Val Ser Val Ala Thr Ala Asn Ala Lys Val Leu	
540 545 550 555	
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Ile Glu Leu Glu Pro Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg	
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575 580 585	
ggc aaa gcc ttt aca acc acc ctc aaa gga gcg cag aga cta gcc gct	3448
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 605 610 615

tca gtt ggg aag gct gtc cat caa gtg ttc gga gga gca ttc cgc tca 3544
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 620 625 630 635

ctg ttc gga ggc atg tcc tgg ata acg caa gga ttg ctg ggg gct ctc 3592
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 640 645 650

ctg ttg tgg atg ggc atc aat gct cgt gat agg tcc ata gct ctc acg 3640
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 655 660 665

ttt ctc gca gtt gga gga gtt ctg ctc ttc ctc tcc gtg aac gtg cac 3688
 Phe Leu Ala Val Gly Gly Val Leu Leu Phe Leu Ser Val Asn Val His
 670 675 680

gct taatttttat ctagagtcga gtttttattg actagttaat cataagataa 3741
 Ala

ataatataca gcattgtaac catcgtcac cgttatacgg ggaataatat taccatacag 3801

tattattaaa ttttcttacg aagaatatag atcgggtattt atcggttagtt tattttacat 3861

ttattaatta aacatgtcta ctattacctg ttatggaaat gacaaattta gttatataat 3921

ttatgataaa attaagataa taataatgaa atcaaataat tatgtaaatg ctactagatt 3981

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agtcgataat gtaaaaaaaaa taaatgataa aactaaccag ttaaaaaacgg atatgattat 4101

atacgttaag gatattgatc ataaaggaag agatacttgc ggttactatg tacaccaaga 4161

tctgggtatct tctatatcaa attggatata tccggtattc gccgttaagg taaataaaat 4221

tattaactat tatatatgta atgaatatga tatacgactt agcgaatgg aatctgatat 4281

gacagaagta atagatgtag ttgataaatt agtaggagga tacaatgatg aaatagcaga 4341

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<212> PRT
<213> West Nile virus

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50 55 60
Ile Thr Tyr Glu Cys Pro Val Leu Ser Ala Gly Asn Asp Pro Glu Asp
65 70 75 80
Ile Asp Cys Trp Cys Thr Lys Ser Ala Val Tyr Val Arg Tyr Gly Arg
85 90 95
Cys Thr Lys Thr Arg His Ser Arg Arg Ser Arg Arg Ser Leu Thr Val
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Gln Thr His Gly Glu Ser Thr Leu Ala Asn Lys Lys Gly Ala Trp Met
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Asp Ser Thr Lys Ala Thr Arg Tyr Leu Val Lys Thr Glu Ser Trp Ile
130 135 140
Leu Arg Asn Pro Gly Tyr Ala Leu Val Ala Ala Val Ile Gly Trp Met
145 150 155 160
Leu Gly Ser Asn Thr Met Gln Arg Val Val Phe Val Val Leu Leu Leu
165 170 175
Leu Val Ala Pro Ala Tyr Ser Phe Asn Cys Leu Gly Met Ser Asn Arg
180 185 190
Asp Phe Leu Glu Gly Val Ser Gly Ala Thr Trp Val Asp Leu Val Leu
195 200 205

Glu Gly Asp Ser Cys Val Thr Ile Met Ser Lys Asp Lys Pro Thr Ile
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 Asp Val Lys Met Met Asn Met Glu Ala Ala Asn Leu Ala Glu Val Arg
 225 230 235 240
 Ser Tyr Cys Tyr Leu Ala Thr Val Ser Asp Leu Ser Thr Lys Ala Ala
 245 250 255
 Cys Pro Thr Met Gly Glu Ala His Asn Asp Lys Arg Ala Asp Pro Ala
 260 265 270
 Phe Val Cys Arg Gln Gly Val Val Asp Arg Gly Trp Gly Asn Gly Cys
 275 280 285
 Gly Leu Phe Gly Lys Gly Ser Ile Asp Thr Cys Ala Lys Phe Ala Cys
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 Ser Thr Lys Ala Ile Gly Arg Thr Ile Leu Lys Glu Asn Ile Lys Tyr
 305 310 315 320
 Glu Val Ala Ile Phe Val His Gly Pro Thr Thr Val Glu Ser His Gly
 325 330 335
 Asn Tyr Ser Thr Gln Val Gly Ala Thr Gln Ala Gly Arg Phe Ser Ile
 340 345 350
 Thr Pro Ala Ala Pro Ser Tyr Thr Leu Lys Leu Gly Glu Tyr Gly Glu
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 Val Thr Val Asp Cys Glu Pro Arg Ser Gly Ile Asp Thr Asn Ala Tyr
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 Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu Val His Arg Glu Trp
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 Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu Pro His Ala Thr Lys
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 450 455 460
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 485 490 495
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Thr Gly Thr Asp Gly Pro Cys Lys Val Pro Ile Ser Ser Ala Ala Ser
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 Val Ser Val Ala Thr Ala Asn Ala Lys Val Leu Ile Glu Leu Glu Pro
 545 550 555 560
 Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg Gly Glu Gln Gln Ile
 565 570 575
 Asn His His Trp His Lys Ser Gly Ser Ser Ile Gly Lys Ala Phe Thr
 580 585 590
 Thr Thr Leu Lys Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala
 595 600 605
 Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr Ser Val Gly Lys Ala
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 Val His Gln Val Phe Gly Gly Ala Phe Arg Ser Leu Phe Gly Gly Met
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 Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu Leu Leu Trp Met Gly
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 <213> West Nile virus

<220>
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 <222> (15)..(2072)

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Gly Asn Asp Pro Glu Asp Ile Asp Cys Trp Cys Thr Lys Ser Ala Val	
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Tyr Val Arg Tyr Gly Arg Cys Thr Lys Thr Arg His Ser Arg Arg Ser	
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Arg Arg Ser Leu Thr Val Gln Thr His Gly Glu Ser Thr Leu Ala Asn	
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Lys Thr Glu Ser Trp Ile Leu Arg Asn Pro Gly Tyr Ala Leu Val Ala	
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Ala Val Ile Gly Trp Met Leu Gly Ser Asn Thr Met Gln Arg Val Val	
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Phe Val Val Leu Leu Leu Leu Val Ala Pro Ala Tyr Ser Phe Asn Cys	
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Trp Val Asp Leu Val Leu Glu Gly Asp Ser Cys Val Thr Ile Met Ser	
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Lys Arg Ala Asp Pro Ala Phe Val Cys Arg Gln Gly Val Val Asp Arg	
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Cys Ala Lys Phe Ala Cys Ser Thr Lys Ala Ile Gly Arg Thr Ile Leu	
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Lys Glu Asn Ile Lys Tyr Glu Val Ala Ile Phe Val His Gly Pro Thr	
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Thr Val Glu Ser His Gly Asn Tyr Ser Thr Gln Val Gly Ala Thr Gln	
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Ala Gly Arg Phe Ser Ile Thr Pro Ala Ala Pro Ser Tyr Thr Leu Lys	
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Leu Gly Glu Tyr Gly Glu Val Thr Val Asp Cys Glu Pro Arg Ser Gly	
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Gly Ala Leu His Gln Ala Leu Ala Gly Ala Ile Pro Val Glu Phe Ser	
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Val Thr Val Asn Pro Phe Val Ser Val Ala Thr Ala Asn Ala Lys Val	
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Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe	
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<211> 686

<212> PRT

<213> West Nile virus

<400> 59

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Thr	Val	Gln	Thr	His	Gly	Glu	Ser	Thr	Leu	Ala	Asn	Lys	Lys	Gly	Ala
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Trp	Met	Asp	Ser	Thr	Lys	Ala	Thr	Arg	Tyr	Leu	Val	Lys	Thr	Glu	Ser
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Trp	Ile	Leu	Arg	Asn	Pro	Gly	Tyr	Ala	Leu	Val	Ala	Ala	Val	Ile	Gly
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Trp	Met	Leu	Gly	Ser	Asn	Thr	Met	Gln	Arg	Val	Val	Phe	Val	Val	Leu
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Leu	Leu	Leu	Val	Ala	Pro	Ala	Tyr	Ser	Phe	Asn	Cys	Leu	Gly	Met	Ser
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Asn	Arg	Asp	Phe	Leu	Glu	Gly	Val	Ser	Gly	Ala	Thr	Trp	Val	Asp	Leu
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Val	Leu	Glu	Gly	Asp	Ser	Cys	Val	Thr	Ile	Met	Ser	Lys	Asp	Lys	Pro
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Thr	Ile	Asp	Val	Lys	Met	Met	Asn	Met	Glu	Ala	Ala	Asn	Leu	Ala	Glu
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Val	Arg	Ser	Tyr	Cys	Tyr	Leu	Ala	Thr	Val	Ser	Asp	Leu	Ser	Thr	Lys
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Pro	Ala	Phe	Val	Cys	Arg	Gln	Gly	Val	Val	Asp	Arg	Gly	Trp	Gly	Asn
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His Gly Asn Tyr Ser	Thr Gln Val Gly Ala	Thr Gln Ala Gly Arg Phe
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Ser Ile Thr Pro Ala	Ala Pro Ser Tyr Thr	Leu Lys Leu Gly Glu Tyr
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Gly Glu Val Thr Val	Asp Cys Glu Pro Arg	Ser Gly Ile Asp Thr Asn
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Val Trp Arg Asn Arg	Glu Thr Leu Met Glu	Phe Glu Glu Pro His Ala
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 Gly Met Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu Leu Leu Trp
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 <222> (2005) .. (4059)

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Val Met Met Thr Val Asn Ala Thr Asp Val Thr Asp Val Ile Thr Ile
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cca aca gct gct gga aag aac cta tgc att gtc aga gca atg gat gtg      2175
Pro Thr Ala Ala Gly Lys Asn Leu Cys Ile Val Arg Ala Met Asp Val
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Gly Tyr Met Cys Asp Asp Thr Ile Thr Tyr Glu Cys Pro Val Leu Ser
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gct ggt aat gat cca gaa gac atc gac tgt tgg tgc aca aag tca gca      2271
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Cys	Leu	Gly	Met	Ser	Asn	Arg	Asp	Phe	Leu	Glu	Gly	Val	Ser	Gly	Ala	
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Thr	Trp	Val	Asp	Leu	Val	Leu	Glu	Gly	Asp	Ser	Cys	Val	Thr	Ile	Met	
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Ala	Asn	Leu	Ala	Glu	Val	Arg	Ser	Tyr	Cys	Tyr	Leu	Ala	Thr	Val	Ser	
	235					240					245					
gat	ctc	tcc	acc	aaa	gct	gcg	tgc	ccg	acc	atg	gga	gaa	gct	cac	aat	2799
Asp	Leu	Ser	Thr	Lys	Ala	Ala	Cys	Pro	Thr	Met	Gly	Glu	Ala	His	Asn	
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Thr Thr Val Glu Ser His Gly Asn Tyr Ser Thr Gln Val Gly Ala Thr	
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Gln Ala Gly Arg Phe Ser Ile Thr Pro Ala Ala Pro Ser Tyr Thr Leu	
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Lys Leu Gly Glu Tyr Gly Glu Val Thr Val Asp Cys Glu Pro Arg Ser	
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ggg att gac acc aat gca tac tac gtg atg act gtt gga aca aag acg	3183
Gly Ile Asp Thr Asn Ala Tyr Tyr Val Met Thr Val Gly Thr Lys Thr	
380 385 390	
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Phe Leu Val His Arg Glu Trp Phe Met Asp Leu Asn Leu Pro Trp Ser	
395 400 405	
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Ser Ala Gly Ser Thr Val Trp Arg Asn Arg Glu Thr Leu Met Glu Phe	
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Lys Met Glu Lys Leu Gln Leu Lys Gly Thr Thr Tyr Gly Val Cys Ser	
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Val Val Leu Glu Leu Gln Tyr Thr Gly Thr Asp Gly Pro Cys Lys Val	
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Leu Val Thr Val Asn Pro Phe Val Ser Val Ala Thr Ala Asn Ala Lys	
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<211> 684

<212> PRT

<213> West Nile virus

<400> 61

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Thr	Asp	Val	Thr	Asp	Val	Ile	Thr	Ile	Pro	Thr	Ala	Ala	Gly	Lys	Asn	35	40	45	
Leu	Cys	Ile	Val	Arg	Ala	Met	Asp	Val	Gly	Tyr	Met	Cys	Asp	Asp	Thr	50	55	60	
Ile	Thr	Tyr	Glu	Cys	Pro	Val	Leu	Ser	Ala	Gly	Asn	Asp	Pro	Glu	Asp	65	70	75	80
Ile	Asp	Cys	Trp	Cys	Thr	Lys	Ser	Ala	Val	Tyr	Val	Arg	Tyr	Gly	Arg	85	90	95	
Cys	Thr	Lys	Thr	Arg	His	Ser	Arg	Arg	Ser	Arg	Arg	Ser	Leu	Thr	Val	100	105	110	
Gln	Thr	His	Gly	Glu	Ser	Thr	Leu	Ala	Asn	Lys	Lys	Gly	Ala	Trp	Met	115	120	125	
Asp	Ser	Thr	Lys	Ala	Thr	Arg	Tyr	Leu	Val	Lys	Thr	Glu	Ser	Trp	Ile	130	135	140	
Leu	Arg	Asn	Pro	Gly	Tyr	Ala	Leu	Val	Ala	Ala	Val	Ile	Gly	Trp	Met	145	150	155	160

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 Asp Phe Leu Glu Gly Val Ser Gly Ala Thr Trp Val Asp Leu Val Leu
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 Glu Gly Asp Ser Cys Val Thr Ile Met Ser Lys Asp Lys Pro Thr Ile
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 Asp Val Lys Met Met Asn Met Glu Ala Ala Asn Leu Ala Glu Val Arg
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 Cys Pro Thr Met Gly Glu Ala His Asn Asp Lys Arg Ala Asp Pro Ala
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 Phe Val Cys Arg Gln Gly Val Val Asp Arg Gly Trp Gly Asn Gly Cys
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 Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu Val His Arg Glu Trp
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 Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu Pro His Ala Thr Lys
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 Gln Ser Val Ile Ala Leu Gly Ser Gln Glu Gly Ala Leu His Gln Ala
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Thr Ser Gly His Leu Lys Cys Arg Val Lys Met Glu Lys Leu Gln Leu
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Lys Gly Thr Thr Tyr Gly Val Cys Ser Lys Ala Phe Lys Phe Leu Gly
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Thr Pro Ala Asp Thr Gly His Gly Thr Val Val Leu Glu Leu Gln Tyr
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Thr Gly Thr Asp Gly Pro Cys Lys Val Pro Ile Ser Ser Ala Ala Ser
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Leu Asn Asp Leu Thr Pro Val Gly Arg Leu Val Thr Val Asn Pro Phe
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Val Ser Val Ala Thr Ala Asn Ala Lys Val Leu Ile Glu Leu Glu Pro
545                               550                               555                               560

Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg Gly Glu Gln Gln Ile
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Asn His His Trp His Lys Ser Gly Ser Ser Ile Gly Lys Ala Phe Thr
                               580                               585                               590

Thr Thr Leu Lys Gly Ala Gln Arg Leu Ala Ala Leu Gly Asp Thr Ala
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Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr Ser Val Gly Lys Ala
610                               615                               620

Val His Gln Val Phe Gly Gly Ala Phe Arg Ser Leu Phe Gly Gly Met
625                               630                               635                               640

Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu Leu Leu Trp Met Gly
                               645                               650                               655

Ile Asn Ala Arg Asp Arg Ser Ile Ala Leu Thr Phe Leu Ala Val Gly
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<210> 66

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                               Met Ser Lys Lys Pro Gly
                               1           5

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Gly Pro Gly Lys Ser Arg Ala Val Asn Met Leu Lys Arg Gly Met Pro
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cgc gtg ttg tcc ttg att gga ctg aag agg gct atg ttg agc ctg atc 210
Arg Val Leu Ser Leu Ile Gly Leu Lys Arg Ala Met Leu Ser Leu Ile
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gac ggc aag ggg cca ata cga ttt gtg ttg gct ctc ttg gcg ttc ttc 258
Asp Gly Lys Gly Pro Ile Arg Phe Val Leu Ala Leu Leu Ala Phe Phe
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Glu Leu Gly Thr Leu Thr Ser Ala Ile Asn Arg Arg Ser Ser Lys Gln
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Lys Lys Arg Gly Gly Lys Thr Gly Ile Ala Val Met Ile Gly Leu Ile
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Met Thr Val Asn Ala Thr Asp Val Thr Asp Val Ile Thr Ile Pro Thr
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Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr	
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ctg ttc gga ggc atg tcc tgg ata acg caa gga ttg ctg ggg gct ctc	2370
Leu Phe Gly Gly Met Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu	
745 750 755	
ctg ttg tgg atg ggc atc aat gct cgt gat agg tcc ata gct ctc acg	2418
Leu Leu Trp Met Gly Ile Asn Ala Arg Asp Arg Ser Ile Ala Leu Thr	
760 765 770	
ttt ctc gca gtt gga gga gtt ctg ctc ttc ctc tcc gtg aac gtg cac	2466
Phe Leu Ala Val Gly Gly Val Leu Leu Phe Leu Ser Val Asn Val His	
775 780 785 790	
gct gac act ggg tgt gcc ata gac atc agc cgg caa gag ctg aga tgt	2514
Ala Asp Thr Gly Cys Ala Ile Asp Ile Ser Arg Gln Glu Leu Arg Cys	
795 800 805	
gga agt gga gtg ttc ata cac aat gat gtg gag gct tgg atg gac cgg	2562
Gly Ser Gly Val Phe Ile His Asn Asp Val Glu Ala Trp Met Asp Arg	
810 815 820	
tac aag tat tac cct gaa acg cca caa ggc cta gcc aag atc att cag	2610
Tyr Lys Tyr Tyr Pro Glu Thr Pro Gln Gly Leu Ala Lys Ile Ile Gln	
825 830 835	
aaa gct cat aag gaa gga gtg tgc ggt cta cga tca gtt tcc aga ctg	2658
Lys Ala His Lys Glu Gly Val Cys Gly Leu Arg Ser Val Ser Arg Leu	
840 845 850	
gag cat caa atg tgg gaa gca gtg aag gac gag ctg aac act ctt ttg	2706
Glu His Gln Met Trp Glu Ala Val Lys Asp Glu Leu Asn Thr Leu Leu	
855 860 865 870	

aag gag aat ggt gtg gac ctt agt gtc gtg gtt gag aaa cag gag gga	2754
Lys Glu Asn Gly Val Asp Leu Ser Val Val Val Glu Lys Gln Glu Gly	
875 880 885	
atg tac aag tca gca cct aaa cgc ctc acc gcc acc acg gaa aaa ttg	2802
Met Tyr Lys Ser Ala Pro Lys Arg Leu Thr Ala Thr Thr Glu Lys Leu	
890 895 900	
gaa att ggc tgg aag gcc tgg gga aag agt att tta ttt gca cca gaa	2850
Glu Ile Gly Trp Lys Ala Trp Gly Lys Ser Ile Leu Phe Ala Pro Glu	
905 910 915	
ctc gcc aac aac acc ttt gtg gtt gat ggt ccg gag acc aag gaa tgt	2898
Leu Ala Asn Asn Thr Phe Val Val Asp Gly Pro Glu Thr Lys Glu Cys	
920 925 930	
ccg act cag aat cgc gct tgg aat agc tta gaa gtg gag gat ttt gga	2946
Pro Thr Gln Asn Arg Ala Trp Asn Ser Leu Glu Val Glu Asp Phe Gly	
935 940 945 950	
ttt ggt ctc acc agc act cgg atg ttc ctg aag gtc aga gag agc aac	2994
Phe Gly Leu Thr Ser Thr Arg Met Phe Leu Lys Val Arg Glu Ser Asn	
955 960 965	
aca act gaa tgt gac tcg aag atc att gga acg gct gtc aag aac aac	3042
Thr Thr Glu Cys Asp Ser Lys Ile Ile Gly Thr Ala Val Lys Asn Asn	
970 975 980	
ttg gcg atc cac agt gac ctg tcc tat tgg att gaa agc agg ctc aat	3090
Leu Ala Ile His Ser Asp Leu Ser Tyr Trp Ile Glu Ser Arg Leu Asn	
985 990 995	
gat acg tgg aag ctt gaa agg gca gtt ctg ggt gaa gtc aaa tca tgt	3138
Asp Thr Trp Lys Leu Glu Arg Ala Val Leu Gly Glu Val Lys Ser Cys	
1000 1005 1010	
acg tgg cct gag acg cat acc ttg tgg ggc gat gga atc ctt gag agt	3186
Thr Trp Pro Glu Thr His Thr Leu Trp Gly Asp Gly Ile Leu Glu Ser	
1015 1020 1025 1030	
gac ttg ata ata cca gtc aca ctg gcg gga cca cga agc aat cac aat	3234
Asp Leu Ile Ile Pro Val Thr Leu Ala Gly Pro Arg Ser Asn His Asn	
1035 1040 1045	
cgg aga cct ggg tac aag aca caa aac cag ggc cca tgg gac gaa ggc	3282
Arg Arg Pro Gly Tyr Lys Thr Gln Asn Gln Gly Pro Trp Asp Glu Gly	
1050 1055 1060	
cgg gta gag att gac ttc gat tac tgc cca gga act acg gtc acc ctg	3330
Arg Val Glu Ile Asp Phe Asp Tyr Cys Pro Gly Thr Thr Val Thr Leu	
1065 1070 1075	
agt gag agc tgc gga cac cgt gga cct gcc act cgc acc acc aca gag	3378
Ser Glu Ser Cys Gly His Arg Gly Pro Ala Thr Arg Thr Thr Thr Glu	
1080 1085 1090	

agc Ser 1095	gga Gly	aag Lys	ttg Leu	ata Ile	aca Thr	gat Asp	tgg Trp	tgc Cys	tgc Cys	agg Arg	agc Ser	tgc Cys	acc Thr	tta Leu	cca Pro	3426
			1100						1105			1110				
cca Pro	ctg Leu	cgc Arg	tac Tyr	caa Gln	act Thr	gac Asp	agc Ser	ggc Gly	tgt Cys	tgg Trp	tat Tyr	ggc Gly	atg Met	gag Glu	atc Ile	3474
			1115						1120			1125				
aga Arg	cca Pro	cag Gln	aga Arg	cat His	gat Asp	gaa Glu	aag Lys	acc Thr	ctc Leu	gtg Val	cag Gln	tca Ser	caa Gln	gtg Val	aat Asn	3522
			1130						1135			1140				
gct Ala	tat Tyr	aat Asn	gct Ala	gat Asp	atg Met	att Ile	gac Asp	cct Pro	ttt Phe	cag Gln	ttg Leu	ggc Gly	ctt Leu	ctg Leu	gtc Val	3570
			1145						1150			1155				
gtg Val	ttc Phe	ttg Leu	gcc Ala	acc Thr	cag Gln	gag Glu	gtc Val	ctt Leu	cgc Arg	aag Lys	agg Arg	tgg Trp	aca Thr	gcc Ala	aag Lys	3618
			1160						1165			1170				
atc Ile 1175	agc Ser	atg Met	cca Pro	gct Ala	ata Ile	ctg Leu	att Ile	gct Ala	ctg Leu	cta Leu	gtc Val	ctg Leu	gtg Val	ttt Phe	ggg Gly	3666
			1180						1185			1190				
ggc Gly	att Ile	act Thr	tac Tyr	act Thr	gat Asp	gtg Val	tta Leu	cgc Arg	tat Tyr	gtc Val	atc Ile	ttg Leu	gtg Val	ggg Gly	gca Ala	3714
			1195						1200			1205				
gct Ala	ttc Phe	gca Ala	gaa Glu	tct Ser	aat Asn	tgc Ser	gga Gly	gga Gly	gac Asp	gtg Val	gta Val	cac His	ttg Leu	gcg Ala	ctc Leu	3762
			1210						1215			1220				
atg Met	gcg Ala	acc Thr	ttc Phe	aag Lys	ata Ile	caa Gln	cca Pro	gtg Val	ttt Phe	atg Met	gtg Val	gca Ala	tgc Ser	ttt Phe	ctc Leu	3810
			1225						1230			1235				
aaa Lys 1240	gcg Ala	aga Arg	tgg Trp	acc Thr	aac Asn	cag Gln	gag Glu	aac Asn	att Ile	ttg Leu	ttg Leu	atg Met	ttg Leu	gcg Ala	gct Ala	3858
			1245						1250							
gtt Val 1255	ttc Phe	ttt Phe	caa Gln	atg Met	gct Ala	tat Tyr	cac His	gat Asp	gcc Ala	cgc Arg	caa Gln	att Ile	ctg Leu	ctc Leu	tgg Trp	3906
			1260						1265			1270				
gag Glu	atc Ile	cct Pro	gat Asp	gtg Val	ttg Leu	aat Asn	tca Ser	ctg Leu	gcg Ala	gta Val	gct Ala	tgg Trp	atg Met	ata Ile	ctg Leu	3954
			1275						1280			1285				
aga Arg	gcc Ala	ata Ile	aca Thr	ttc Phe	aca Thr	acg Thr	aca Thr	tca Ser	aac Asn	gtg Val	gtt Val	gtt Val	ccg Pro	ctg Leu	cta Leu	4002
			1290						1295			1300				
gcc Ala	ctg Leu	cta Leu	aca Thr	ccc Pro	ggg Gly	ctg Leu	aga Arg	tgc Cys	ttg Leu	aat Asn	ctg Leu	gat Asp	gtg Val	tac Tyr	agg Arg	4050
			1305						1310			1315				

ata ctg ctg ttg atg gtc gga ata ggc agc ttg atc agg gag aag agg	4098
Ile Leu Leu Leu Met Val Gly Ile Gly Ser Leu Ile Arg Glu Lys Arg	
1320 1325 1330	
agt gca gct gca aaa aag aaa gga gca agt ctg cta tgc ttg gct cta	4146
Ser Ala Ala Ala Lys Lys Lys Gly Ala Ser Leu Leu Cys Leu Ala Leu	
1335 1340 1345 1350	
gcc tca aca gga ctt ttc aac ccc atg atc ctt gct gct gga ctg att	4194
Ala Ser Thr Gly Leu Phe Asn Pro Met Ile Leu Ala Ala Gly Leu Ile	
1355 1360 1365	
gca tgt gat ccc aac cgt aaa cgc gga tgg ccc gca act gaa gtg atg	4242
Ala Cys Asp Pro Asn Arg Lys Arg Gly Trp Pro Ala Thr Glu Val Met	
1370 1375 1380	
aca gct gtc ggc cta atg ttt gcc atc gtc gga ggg ctg gca gag ctt	4290
Thr Ala Val Gly Leu Met Phe Ala Ile Val Gly Gly Leu Ala Glu Leu	
1385 1390 1395	
gac att gac tcc atg gcc att cca atg act atc gcg ggg ctc atg ttt	4338
Asp Ile Asp Ser Met Ala Ile Pro Met Thr Ile Ala Gly Leu Met Phe	
1400 1405 1410	
gct gct ttc gtg att tct ggg aaa tca aca gat atg tgg att gag aga	4386
Ala Ala Phe Val Ile Ser Gly Lys Ser Thr Asp Met Trp Ile Glu Arg	
1415 1420 1425 1430	
acg gcg gac att tcc tgg gaa agt gat gca gaa att aca ggc tgc agc	4434
Thr Ala Asp Ile Ser Trp Glu Ser Asp Ala Glu Ile Thr Gly Ser Ser	
1435 1440 1445	
gaa aga gtt gat gtg cgg ctt gat gat gat gga aac ttc cag ctc atg	4482
Glu Arg Val Asp Val Arg Leu Asp Asp Asp Gly Asn Phe Gln Leu Met	
1450 1455 1460	
aat gat cca gga gca cct tgg aag ata tgg atg ctc aga atg gtc tgt	4530
Asn Asp Pro Gly Ala Pro Trp Lys Ile Trp Met Leu Arg Met Val Cys	
1465 1470 1475	
ctc gcg att agt gcg tac acc ccc tgg gca atc ttg ccc tca gta gtt	4578
Leu Ala Ile Ser Ala Tyr Thr Pro Trp Ala Ile Leu Pro Ser Val Val	
1480 1485 1490	
gga ttt tgg ata act ctc caa tac aca aag aga gga ggc gtg ttg tgg	4626
Gly Phe Trp Ile Thr Leu Gln Tyr Thr Lys Arg Gly Gly Val Leu Trp	
1495 1500 1505 1510	
gac act ccc tca cca aag gag tac aaa aag ggg gac acg acc acc ggc	4674
Asp Thr Pro Ser Pro Lys Glu Tyr Lys Lys Gly Asp Thr Thr Thr Gly	
1515 1520 1525	
gtc tac agg atc atg act cgt ggg ctg ctc ggc agt tat caa gca gga	4722
Val Tyr Arg Ile Met Thr Arg Gly Leu Leu Gly Ser Tyr Gln Ala Gly	
1530 1535 1540	

gcg ggc gtg atg gtt gaa ggt gtt ttc cac acc ctt tgg cat aca aca	4770
Ala Gly Val Met Val Glu Gly Val Phe His Thr Leu Trp His Thr Thr	
1545 1550 1555	
aaa gga gcc gct ttg atg agc gga gag ggc cgc ctg gac cca tac tgg	4818
Lys Gly Ala Ala Leu Met Ser Gly Glu Gly Arg Leu Asp Pro Tyr Trp	
1560 1565 1570	
ggc agt gtc aag gag gat cga ctt tgt tac gga gga ccc tgg aaa ttg	4866
Gly Ser Val Lys Glu Asp Arg Leu Cys Tyr Gly Gly Pro Trp Lys Leu	
1575 1580 1585 1590	
cag cac aag tgg aac ggg cag gat gag gtg cag atg att gtg gtg gaa	4914
Gln His Lys Trp Asn Gly Gln Asp Glu Val Gln Met Ile Val Val Glu	
1595 1600 1605	
cct ggc aag aac gtt aag aac gtc cag acg aaa cca ggg gtg ttc aaa	4962
Pro Gly Lys Asn Val Lys Asn Val Thr Lys Pro Gly Val Phe Lys	
1610 1615 1620	
aca cct gaa gga gaa atc ggg gcc gtg act ttg gac ttc ccc act gga	5010
Thr Pro Glu Gly Glu Ile Gly Ala Val Thr Leu Asp Phe Pro Thr Gly	
1625 1630 1635	
aca tca ggc tca cca ata gtg gac aaa aac ggt gat gtg att ggg ctt	5058
Thr Ser Gly Ser Pro Ile Val Asp Lys Asn Gly Asp Val Ile Gly Leu	
1640 1645 1650	
tat ggc aat gga gtc ata atg ccc aac ggc tca tac ata agc gcg ata	5106
Tyr Gly Asn Gly Val Ile Met Pro Asn Gly Ser Tyr Ile Ser Ala Ile	
1655 1660 1665 1670	
gtg cag ggt gaa agg atg gat gag cca atc cca gcc gga ttc gaa cct	5154
Val Gln Gly Glu Arg Met Asp Glu Pro Ile Pro Ala Gly Phe Glu Pro	
1675 1680 1685	
gag atg ctg agg aaa aaa cag atc act gta ctg gat ctc cat ccc ggc	5202
Glu Met Leu Arg Lys Lys Gln Ile Thr Val Leu Asp Leu His Pro Gly	
1690 1695 1700	
gcc ggt aaa aca agg agg att ctg cca cag atc atc aaa gag gcc ata	5250
Ala Gly Lys Thr Arg Arg Ile Leu Pro Gln Ile Ile Lys Glu Ala Ile	
1705 1710 1715	
aac aga aga ctg aga aca gcc gtg cta gca cca acc agg gtt gtg gct	5298
Asn Arg Arg Leu Arg Thr Ala Val Leu Ala Pro Thr Arg Val Val Ala	
1720 1725 1730	
gct gag atg gct gaa gca ctg aga gga ctg ccc atc cgg tac cag aca	5346
Ala Glu Met Ala Glu Ala Leu Arg Gly Leu Pro Ile Arg Tyr Gln Thr	
1735 1740 1745 1750	
tcc gca gtg ccc aga gaa cat aat gga aat gag att gtt gat gtc atg	5394
Ser Ala Val Pro Arg Glu His Asn Gly Asn Glu Ile Val Asp Val Met	
1755 1760 1765	

tgt cat gct acc ctc acc cac agg ctg atg tct cct cac agg gtg ccg	5442
Cys His Ala Thr Leu Thr His Arg Leu Met Ser Pro His Arg Val Pro	
1770 1775 1780	
aac tac aac ctg ttc gtg atg gat gag gct cat ttc acc gac cca gct	5490
Asn Tyr Asn Leu Phe Val Met Asp Glu Ala His Phe Thr Asp Pro Ala	
1785 1790 1795	
agc att gca gca aga ggt tac att tcc aca aag gtc gag cta ggg gag	5538
Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr Lys Val Glu Leu Gly Glu	
1800 1805 1810	
gcg gcg gca ata ttc atg aca gcc acc cca cca ggc act tca gat cca	5586
Ala Ala Ala Ile Phe Met Thr Ala Thr Pro Pro Gly Thr Ser Asp Pro	
1815 1820 1825 1830	
ttc cca gag tcc aat tca cca att tcc gac tta cag act gag atc ccg	5634
Phe Pro Glu Ser Asn Ser Pro Ile Ser Asp Leu Gln Thr Glu Ile Pro	
1835 1840 1845	
gat cga gct tgg aac tct gga tac gaa tgg atc aca gaa tac acc ggg	5682
Asp Arg Ala Trp Asn Ser Gly Tyr Glu Trp Ile Thr Glu Tyr Thr Gly	
1850 1855 1860	
aag acg gtt tgg ttt gtg cct agt gtc aag atg ggg aat gag att gcc	5730
Lys Thr Val Trp Phe Val Pro Ser Val Lys Met Gly Asn Glu Ile Ala	
1865 1870 1875	
ctt tgc cta caa cgt gct gga aag aaa gta gtc caa ttg aac aga aag	5778
Leu Cys Leu Gln Arg Ala Gly Lys Lys Val Val Gln Leu Asn Arg Lys	
1880 1885 1890	
tcg tac gag acg gag tac cca aaa tgt aag aac gat gat tgg gac ttt	5826
Ser Tyr Glu Thr Glu Tyr Pro Lys Cys Lys Asn Asp Asp Trp Asp Phe	
1895 1900 1905 1910	
gtt atc aca aca gac ata tct gaa atg ggg gct aac ttc aag gcg agc	5874
Val Ile Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Ser	
1915 1920 1925	
agg gtg att gac agc cgg aag agt gtg aaa cca acc atc ata aca gaa	5922
Arg Val Ile Asp Ser Arg Lys Ser Val Lys Pro Thr Ile Ile Thr Glu	
1930 1935 1940	
gga gaa ggg aga gtg atc ctg gga gaa cca tct gca gtg aca gca gct	5970
Gly Glu Gly Arg Val Ile Leu Gly Glu Pro Ser Ala Val Thr Ala Ala	
1945 1950 1955	
agt gcc gcc cag aga cgt gga cgt atc ggt aga aat ccg tcg caa gtt	6018
Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro Ser Gln Val	
1960 1965 1970	
ggt gat gag tac tgt tat ggg ggg cac acg aat gaa gac gac tcg aac	6066
Gly Asp Glu Tyr Cys Tyr Gly Gly His Thr Asn Glu Asp Asp Ser Asn	
1975 1980 1985 1990	

ttc gcc cat tgg act gag gca cga atc atg ctg gac aac atc aac atg Phe Ala His Trp Thr Glu Ala Arg Ile Met Leu Asp Asn Ile Asn Met 1995 2000 2005	6114
cca aac gga ctg atc gct caa ttc tac caa cca gag cgt gag aag gta Pro Asn Gly Leu Ile Ala Gln Phe Tyr Gln Pro Glu Arg Glu Lys Val 2010 2015 2020	6162
tat acc atg gat ggg gaa tac cgg ctc aga gga gaa gag aga aaa aac Tyr Thr Met Asp Gly Glu Tyr Arg Leu Arg Gly Glu Glu Arg Lys Asn 2025 2030 2035	6210
ttt ctg gaa ctg ttg agg act gca gat ctg cca gtt tgg ctg gct tac Phe Leu Glu Leu Leu Arg Thr Ala Asp Leu Pro Val Trp Leu Ala Tyr 2040 2045 2050	6258
aag gtt gca gcg gct gga gtg tca tac cac gac cgg agg tgg tgc ttt Lys Val Ala Ala Ala Gly Val Ser Tyr His Asp Arg Arg Trp Cys Phe 2055 2060 2065 2070	6306
gat ggt cct agg aca aac aca att tta gaa gac aac aac gaa gtg gaa Asp Gly Pro Arg Thr Asn Thr Ile Leu Glu Asp Asn Asn Glu Val Glu 2075 2080 2085	6354
gtc atc acg aag ctt ggt gaa agg aag att ctg agg ccg cgc tgg att Val Ile Thr Lys Leu Gly Glu Arg Lys Ile Leu Arg Pro Arg Trp Ile 2090 2095 2100	6402
gac gcc agg gtg tac tcg gat cac cag gca cta aag gcg ttc aag gac Asp Ala Arg Val Tyr Ser Asp His Gln Ala Leu Lys Ala Phe Lys Asp 2105 2110 2115	6450
ttc gcc tcg gga aaa cgt tct cag ata ggg ctc att gag gtt ctg gga Phe Ala Ser Gly Lys Arg Ser Gln Ile Gly Leu Ile Glu Val Leu Gly 2120 2125 2130	6498
aag atg cct gag cac ttc atg ggg aag aca tgg gaa gca ctt gac acc Lys Met Pro Glu His Phe Met Gly Lys Thr Trp Glu Ala Leu Asp Thr 2135 2140 2145 2150	6546
atg tac gtt gtg gcc act gca gag aaa gga gga aga gct cac aga atg Met Tyr Val Val Ala Thr Ala Glu Lys Gly Gly Arg Ala His Arg Met 2155 2160 2165	6594
gcc ctg gag gaa ctg cca gat gct ctt cag aca att gcc ttg att gcc Ala Leu Glu Glu Leu Pro Asp Ala Leu Gln Thr Ile Ala Leu Ile Ala 2170 2175 2180	6642
tta ttg agt gtg atg acc atg gga gta ttc ttc ctc ctc atg cag cgg Leu Leu Ser Val Met Thr Met Gly Val Phe Phe Leu Leu Met Gln Arg 2185 2190 2195	6690
aag ggc att gga aag ata ggt ttg gga ggc gct gtc ttg gga gtc gcg Lys Gly Ile Gly Lys Ile Gly Leu Gly Gly Ala Val Leu Gly Val Ala 2200 2205 2210	6738

acc	ttt	ttc	tgt	tgg	atg	gct	gaa	gtt	cca	gga	acg	aag	atc	gcc	gga	6786
Thr	Phe	Phe	Cys	Trp	Met	Ala	Glu	Val	Pro	Gly	Thr	Lys	Ile	Ala	Gly	
2215			2220			2225			2230							
atg	ttg	ctg	ctc	tcc	ctt	ctc	ttg	atg	att	gtg	cta	att	cct	gag	cca	6834
Met	Leu	Leu	Leu	Ser	Leu	Leu	Met	Ile	Val	Leu	Ile	Pro	Glu	Pro		
2235			2240			2245										
gag	aag	caa	cgt	tcg	cag	aca	gac	aac	cag	cta	gcc	gtg	ttc	ctg	att	6882
Glu	Lys	Gln	Arg	Ser	Gln	Thr	Asp	Asn	Gln	Leu	Ala	Val	Phe	Leu	Ile	
2250			2255			2260										
tgt	gtc	atg	acc	ctt	gtg	agc	gca	gtg	gca	gcc	aac	gag	atg	ggg	tgg	6930
Cys	Val	Met	Thr	Leu	Val	Ser	Ala	Val	Ala	Ala	Asn	Glu	Met	Gly	Trp	
2265			2270			2275										
cta	gat	aag	acc	aag	agt	gac	ata	agc	agt	ttg	ttt	ggg	caa	aga	att	6978
Leu	Asp	Lys	Thr	Lys	Ser	Asp	Ile	Ser	Ser	Leu	Phe	Gly	Gln	Arg	Ile	
2280			2285			2290										
gag	gtc	aag	gag	aat	ttc	agc	atg	gga	gag	ttt	ctt	ttg	gac	ttg	agg	7026
Glu	Val	Lys	Glu	Asn	Phe	Ser	Met	Gly	Glu	Phe	Leu	Leu	Asp	Leu	Arg	
2295			2300			2305			2310							
ccg	gca	aca	gcc	tgg	tca	ctg	tac	gct	gtg	aca	aca	gcg	gtc	ctc	act	7074
Pro	Ala	Thr	Ala	Trp	Ser	Leu	Tyr	Ala	Val	Thr	Thr	Ala	Val	Leu	Thr	
2315			2320			2325										
cca	ctg	cta	aag	cat	ttg	atc	acg	tca	gat	tac	atc	aac	acc	tca	ttg	7122
Pro	Leu	Leu	Lys	His	Leu	Ile	Thr	Ser	Asp	Tyr	Ile	Asn	Thr	Ser	Leu	
2330			2335			2340										
acc	tca	ata	aac	gtt	cag	gca	agt	gca	cta	ttc	aca	ctc	gcg	cga	ggc	7170
Thr	Ser	Ile	Asn	Val	Gln	Ala	Ser	Ala	Leu	Phe	Thr	Leu	Ala	Arg	Gly	
2345			2350			2355										
ttc	ccc	ttc	gtc	gat	gtt	gga	gtg	tcg	gct	ctc	ctg	cta	gca	gcc	gga	7218
Phe	Pro	Phe	Val	Asp	Val	Gly	Val	Ser	Ala	Leu	Leu	Leu	Ala	Ala	Gly	
2360			2365			2370										
tgc	tgg	gga	caa	gtc	acc	ctc	acc	gtt	acg	gta	aca	gcg	gca	aca	ctc	7266
Cys	Trp	Gly	Gln	Val	Thr	Leu	Thr	Val	Thr	Val	Thr	Ala	Ala	Thr	Leu	
2375			2380			2385			2390							
ctt	ttt	tgc	cac	tat	gcc	tac	atg	gtt	ccc	ggg	tgg	caa	gct	gag	gca	7314
Leu	Phe	Cys	His	Tyr	Ala	Tyr	Met	Val	Pro	Gly	Trp	Gln	Ala	Glu	Ala	
2395			2400			2405										
atg	cgc	tca	gcc	cag	cgg	cgg	aca	gcg	gcc	gga	atc	atg	aag	aac	gct	7362
Met	Arg	Ser	Ala	Gln	Arg	Arg	Thr	Ala	Ala	Gly	Ile	Met	Lys	Asn	Ala	
2410			2415			2420										
gta	gtg	gat	ggc	atc	gtg	gcc	acg	gac	gtc	cca	gaa	tta	gag	cgc	acc	7410
Val	Val	Asp	Gly	Ile	Val	Ala	Thr	Asp	Val	Pro	Glu	Leu	Glu	Arg	Thr	
2425			2430			2435										

aca ccc atc atg cag aag aaa gtt gga cag atc atg ctg atc ttg gtg	7458
Thr Pro Ile Met Gln Lys Lys Val Gly Gln Ile Met Leu Ile Leu Val	
2440 2445 2450	
tct cta gct gca gta gta gtg aac ccg tct gtg aag aca gta cga gaa	7506
Ser Leu Ala Ala Val Val Val Asn Pro Ser Val Lys Thr Val Arg Glu	
2455 2460 2465 2470	
gcc gga att ttg atc acg gcc gca gcg gtg acg ctt tgg gag aat gga	7554
Ala Gly Ile Leu Ile Thr Ala Ala Val Thr Leu Trp Glu Asn Gly	
2475 2480 2485	
gca agc tct gtt tgg aac gca aca act gcc atc gga ctc tgc cac atc	7602
Ala Ser Ser Val Trp Asn Ala Thr Thr Ala Ile Gly Leu Cys His Ile	
2490 2495 2500	
atg cgt ggg ggt tgg ttg tca tgt cta tcc ata aca tgg aca ctc ata	7650
Met Arg Gly Gly Trp Leu Ser Cys Leu Ser Ile Thr Trp Thr Leu Ile	
2505 2510 2515	
aag aac atg gaa aaa cca gga cta aaa aga ggt ggg gca aaa gga cgc	7698
Lys Asn Met Glu Lys Pro Gly Leu Lys Arg Gly Gly Ala Lys Gly Arg	
2520 2525 2530	
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Thr Leu Gly Glu Val Trp Lys Glu Arg Leu Asn Gln Met Thr Lys Glu	
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Glu Phe Thr Arg Tyr Arg Lys Glu Ala Ile Glu Val Asp Arg Ser	
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Ala Ala Lys His Ala Arg Lys Glu Gly Asn Val Thr Gly Gly His Pro	
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Val Ser Arg Gly Thr Ala Lys Leu Arg Trp Leu Val Glu Arg Arg Phe	
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Leu Glu Pro Val Gly Lys Val Ile Asp Leu Gly Cys Gly Arg Gly Gly	
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Trp Cys Tyr Tyr Met Ala Thr Gln Lys Arg Val Gln Glu Val Arg Gly	
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Tyr Thr Lys Gly Gly Pro Gly His Glu Glu Pro Gln Leu Val Gln Ser	
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Tyr Gly Trp Asn Ile Val Thr Met Lys Ser Gly Val Asp Val Phe Tyr	
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Arg Pro Ser Glu Cys Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser	
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Ser Ser Ser Ala Glu Val Glu Glu His Arg Thr Ile Arg Val Leu Glu	
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Met Val Glu Asp Trp Leu His Arg Gly Pro Arg Glu Phe Cys Val Lys	
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Val Leu Cys Pro Tyr Met Pro Lys Val Ile Glu Lys Met Glu Leu Leu	
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Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Asn Pro Leu Ser Arg Asn	
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Ser Thr His Glu Met Tyr Trp Val Ser Arg Ala Ser Gly Asn Val Val	
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cat tca gtg aat atg acc agc cag gtg ctc cta gga aga atg gaa aaa	8418
His Ser Val Asn Met Thr Ser Gln Val Leu Leu Gly Arg Met Glu Lys	
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agg acc tgg aag gga ccc caa tac gag gaa gat gta aac ttg gga agt	8466
Arg Thr Trp Lys Gly Pro Gln Tyr Glu Glu Asp Val Asn Leu Gly Ser	
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Gly Thr Arg Ala Val Gly Lys Pro Leu Leu Asn Ser Asp Thr Ser Lys	
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Ile Lys Asn Arg Ile Glu Arg Leu Arg Arg Glu Tyr Ser Ser Thr Trp	
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His His Asp Glu Asn His Pro Tyr Arg Thr Trp Asn Tyr His Gly Ser	
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Tyr Asp Val Lys Pro Thr Gly Ser Ala Ser Ser Leu Val Asn Gly Val	
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Val Arg Leu Leu Ser Lys Pro Trp Asp Thr Ile Thr Asn Val Thr Thr	
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Met Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg Val Phe Lys	
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Lys Arg Pro Arg Met Cys Ser Arg Glu Glu Phe Ile Arg Lys Val Asn	
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Asn Met Met Gly Lys Arg Glu Lys Lys Pro Gly Glu Phe Gly Lys Ala	
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Lys Gly Ser Arg Ala Ile Trp Phe Met Trp Leu Gly Ala Arg Phe Leu	
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gag ttc gag gct ctg ggt ttt ctc aat gaa gac cac tgg ctt gga aga	9186
Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Leu Gly Arg	
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Tyr Ile Leu Arg Glu Val Gly Thr Arg Pro Gly Gly Lys Ile Tyr Ala	
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Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Arg Ala Asp Leu Glu	
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Asn Glu Ala Lys Val Leu Glu Leu Leu Asp Gly Glu His Arg Arg Leu	
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Phe Thr Asn Leu Ala Val Gln Leu Val Arg Met Met Glu Gly Glu Gly	
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Val Ile Gly Pro Asp Asp Val Glu Lys Leu Thr Lys Gly Lys Gly Pro	
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Lys Val Arg Thr Trp Leu Phe Glu Asn Gly Glu Glu Arg Leu Ser Arg	
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 Thr Val Leu
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<210> 67

<211> 3433

<212> PRT

<213> West Nile virus

<400> 67

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Ala	Met	Leu 35	Ser	Leu	Ile	Asp	Gly 40	Lys	Gly	Pro	Ile	Arg 45	Phe	Val	Leu
Ala	Leu 50	Leu	Ala	Phe	Phe	Arg 55	Phe	Thr	Ala	Ile	Ala 60	Pro	Thr	Arg	Ala
Val 65	Leu	Asp	Arg	Trp	Arg 70	Gly	Val	Asn	Lys	Gln 75	Thr	Ala	Met	Lys	His 80
Leu	Leu	Ser	Phe	Lys 85	Lys	Glu	Leu	Gly	Thr 90	Leu	Thr	Ser	Ala	Ile 95	Asn
Arg	Arg	Ser	Ser 100	Lys	Gln	Lys	Lys	Arg 105	Gly	Gly	Lys	Thr	Gly 110	Ile	Ala
Val	Met	Ile 115	Gly	Leu	Ile	Ala	Ser 120	Val	Gly	Ala	Val	Thr 125	Leu	Ser	Asn
Phe 130	Gln	Gly	Lys	Val	Met	Met 135	Thr	Val	Asn	Ala	Thr 140	Asp	Val	Thr	Asp
Val 145	Ile	Thr	Ile	Pro	Thr 150	Ala	Ala	Gly	Lys	Asn 155	Leu	Cys	Ile	Val	Arg 160
Ala	Met	Asp	Val 165	Gly	Tyr	Met	Cys	Asp 170	Asp	Thr	Ile	Thr	Tyr	Glu 175	Cys
Pro	Val	Leu	Ser 180	Ala	Gly	Asn	Asp	Pro 185	Glu	Asp	Ile	Asp	Cys 190	Trp	Cys
Thr	Lys	Ser 195	Ala	Val	Tyr	Val	Arg 200	Tyr	Gly	Arg	Cys	Thr 205	Lys	Thr	Arg
His 210	Ser	Arg	Arg	Ser	Arg	Arg 215	Ser	Leu	Thr	Val	Gln 220	Thr	His	Gly	Glu
Ser 225	Thr	Leu	Ala	Asn	Lys 230	Lys	Gly	Ala	Trp	Met 235	Asp	Ser	Thr	Lys	Ala 240
Thr	Arg	Tyr	Leu 245	Val	Lys	Thr	Glu	Ser	Trp 250	Ile	Leu	Arg	Asn	Pro 255	Gly
Tyr	Ala	Leu 260	Val	Ala	Ala	Val	Ile	Gly 265	Trp	Met	Leu	Gly	Ser 270	Asn	Thr
Met	Gln	Arg 275	Val	Val	Phe	Val	Val 280	Leu	Leu	Leu	Leu	Val 285	Ala	Pro	Ala
Tyr 290	Ser	Phe	Asn	Cys	Leu	Gly 295	Met	Ser	Asn	Arg	Asp 300	Phe	Leu	Glu	Gly
Val 305	Ser	Gly	Ala	Thr	Trp 310	Val	Asp	Leu	Val	Leu 315	Glu	Gly	Asp	Ser	Cys 320

Val	Thr	Ile	Met	Ser	Lys	Asp	Lys	Pro	Thr	Ile	Asp	Val	Lys	Met	Met	325	330	335
Asn	Met	Glu	Ala	Ala	Asn	Leu	Ala	Glu	Val	Arg	Ser	Tyr	Cys	Tyr	Leu	340	345	350
Ala	Thr	Val	Ser	Asp	Leu	Ser	Thr	Lys	Ala	Ala	Cys	Pro	Thr	Met	Gly	355	360	365
Glu	Ala	His	Asn	Asp	Lys	Arg	Ala	Asp	Pro	Ala	Phe	Val	Cys	Arg	Gln	370	375	380
Gly	Val	Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly	Cys	Gly	Leu	Phe	Gly	Lys	385	390	395
Gly	Ser	Ile	Asp	Thr	Cys	Ala	Lys	Phe	Ala	Cys	Ser	Thr	Lys	Ala	Ile	405	410	415
Gly	Arg	Thr	Ile	Leu	Lys	Glu	Asn	Ile	Lys	Tyr	Glu	Val	Ala	Ile	Phe	420	425	430
Val	His	Gly	Pro	Thr	Thr	Val	Glu	Ser	His	Gly	Asn	Tyr	Ser	Thr	Gln	435	440	445
Val	Gly	Ala	Thr	Gln	Ala	Gly	Arg	Phe	Ser	Ile	Thr	Pro	Ala	Ala	Pro	450	455	460
Ser	Tyr	Thr	Leu	Lys	Leu	Gly	Glu	Tyr	Gly	Glu	Val	Thr	Val	Asp	Cys	465	470	475
Glu	Pro	Arg	Ser	Gly	Ile	Asp	Thr	Asn	Ala	Tyr	Tyr	Val	Met	Thr	Val	485	490	495
Gly	Thr	Lys	Thr	Phe	Leu	Val	His	Arg	Glu	Trp	Phe	Met	Asp	Leu	Asn	500	505	510
Leu	Pro	Trp	Ser	Ser	Ala	Gly	Ser	Thr	Val	Trp	Arg	Asn	Arg	Glu	Thr	515	520	525
Leu	Met	Glu	Phe	Glu	Glu	Pro	His	Ala	Thr	Lys	Gln	Ser	Val	Ile	Ala	530	535	540
Leu	Gly	Ser	Gln	Glu	Gly	Ala	Leu	His	Gln	Ala	Leu	Ala	Gly	Ala	Ile	545	550	555
Pro	Val	Glu	Phe	Ser	Ser	Asn	Thr	Val	Lys	Leu	Thr	Ser	Gly	His	Leu	565	570	575
Lys	Cys	Arg	Val	Lys	Met	Glu	Lys	Leu	Gln	Leu	Lys	Gly	Thr	Thr	Tyr	580	585	590
Gly	Val	Cys	Ser	Lys	Ala	Phe	Lys	Phe	Leu	Gly	Thr	Pro	Ala	Asp	Thr	595	600	605
Gly	His	Gly	Thr	Val	Val	Leu	Glu	Leu	Gln	Tyr	Thr	Gly	Thr	Asp	Gly	610	615	620

Pro	Cys	Lys	Val	Pro	Ile	Ser	Ser	Val	Ala	Ser	Leu	Asn	Asp	Leu	Thr	625	630	635	640
Pro	Val	Gly	Arg	Leu	Val	Thr	Val	Asn	Pro	Phe	Val	Ser	Val	Ala	Thr	645	650	655	
Ala	Asn	Ala	Lys	Val	Leu	Ile	Glu	Leu	Glu	Pro	Pro	Phe	Gly	Asp	Ser	660	665	670	
Tyr	Ile	Val	Val	Gly	Arg	Gly	Glu	Gln	Gln	Ile	Asn	His	His	Trp	His	675	680	685	
Lys	Ser	Gly	Ser	Ser	Ile	Gly	Lys	Ala	Phe	Thr	Thr	Thr	Leu	Lys	Gly	690	695	700	
Ala	Gln	Arg	Leu	Ala	Ala	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser	705	710	715	720
Val	Gly	Gly	Val	Phe	Thr	Ser	Val	Gly	Lys	Ala	Val	His	Gln	Val	Phe	725	730	735	
Gly	Gly	Ala	Phe	Arg	Ser	Leu	Phe	Gly	Gly	Met	Ser	Trp	Ile	Thr	Gln	740	745	750	
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Arg	Ser	Ile	Ala	Leu	Thr	Phe	Leu	Ala	Val	Gly	Gly	Val	Leu	Leu	Phe	770	775	780	
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Arg	Gln	Glu	Leu	Arg	Cys	Gly	Ser	Gly	Val	Phe	Ile	His	Asn	Asp	Val	805	810	815	
Glu	Ala	Trp	Met	Asp	Arg	Tyr	Lys	Tyr	Tyr	Pro	Glu	Thr	Pro	Gln	Gly	820	825	830	
Leu	Ala	Lys	Ile	Ile	Gln	Lys	Ala	His	Lys	Glu	Gly	Val	Cys	Gly	Leu	835	840	845	
Arg	Ser	Val	Ser	Arg	Leu	Glu	His	Gln	Met	Trp	Glu	Ala	Val	Lys	Asp	850	855	860	
Glu	Leu	Asn	Thr	Leu	Leu	Lys	Glu	Asn	Gly	Val	Asp	Leu	Ser	Val	Val	865	870	875	880
Val	Glu	Lys	Gln	Glu	Gly	Met	Tyr	Lys	Ser	Ala	Pro	Lys	Arg	Leu	Thr	885	890	895	
Ala	Thr	Thr	Glu	Lys	Leu	Glu	Ile	Gly	Trp	Lys	Ala	Trp	Gly	Lys	Ser	900	905	910	
Ile	Leu	Phe	Ala	Pro	Glu	Leu	Ala	Asn	Asn	Thr	Phe	Val	Val	Asp	Gly	915	920	925	

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 Glu Val Glu Asp Phe Gly Phe Gly Leu Thr Ser Thr Arg Met Phe Leu
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 Thr Ala Val Lys Asn Asn Leu Ala Ile His Ser Asp Leu Ser Tyr Trp
 980 985 990
 Ile Glu Ser Arg Leu Asn Asp Thr Trp Lys Leu Glu Arg Ala Val Leu
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 1155 1160 1165
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 Leu Asp Phe Pro Thr Gly Thr Ser Gly Ser Pro Ile Val Asp Lys Asn
 1635 1640 1645
 Gly Asp Val Ile Gly Leu Tyr Gly Asn Gly Val Ile Met Pro Asn Gly
 1650 1655 1660
 Ser Tyr Ile Ser Ala Ile Val Gln Gly Glu Arg Met Asp Glu Pro Ile
 1665 1670 1675 1680
 Pro Ala Gly Phe Glu Pro Glu Met Leu Arg Lys Lys Gln Ile Thr Val
 1685 1690 1695
 Leu Asp Leu His Pro Gly Ala Gly Lys Thr Arg Arg Ile Leu Pro Gln
 1700 1705 1710
 Ile Ile Lys Glu Ala Ile Asn Arg Arg Leu Arg Thr Ala Val Leu Ala
 1715 1720 1725
 Pro Thr Arg Val Val Ala Ala Glu Met Ala Glu Ala Leu Arg Gly Leu
 1730 1735 1740
 Pro Ile Arg Tyr Gln Thr Ser Ala Val Pro Arg Glu His Asn Gly Asn
 1745 1750 1755 1760
 Glu Ile Val Asp Val / Met Cys His Ala Thr Leu Thr His Arg Leu Met
 1765 1770 1775
 Ser Pro His Arg Val Pro Asn Tyr Asn Leu Phe Val Met Asp Glu Ala
 1780 1785 1790
 His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr
 1795 1800 1805
 Lys Val Glu Leu Gly Glu Ala Ala Ala Ile Phe Met Thr Ala Thr Pro
 1810 1815 1820
 Pro Gly Thr Ser Asp Pro Phe Pro Glu Ser Asn Ser Pro Ile Ser Asp
 1825 1830 1835 1840

Leu Gln Thr Glu Ile Pro Asp Arg Ala Trp Asn Ser Gly Tyr Glu Trp
 1845 1850 1855
 Ile Thr Glu Tyr Thr Gly Lys Thr Val Trp Phe Val Pro Ser Val Lys
 1860 1865 1870
 Met Gly Asn Glu Ile Ala Leu Cys Leu Gln Arg Ala Gly Lys Lys Val
 1875 1880 1885
 Val Gln Leu Asn Arg Lys Ser Tyr Glu Thr Glu Tyr Pro Lys Cys Lys
 1890 1895 1900
 Asn Asp Asp Trp Asp Phe Val Ile Thr Thr Asp Ile Ser Glu Met Gly
 1905 1910 1915 1920
 Ala Asn Phe Lys Ala Ser Arg Val Ile Asp Ser Arg Lys Ser Val Lys
 1925 1930 1935
 Pro Thr Ile Ile Thr Glu Gly Glu Gly Arg Val Ile Leu Gly Glu Pro
 1940 1945 1950
 Ser Ala Val Thr Ala Ala Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly
 1955 1960 1965
 Arg Asn Pro Ser Gln Val Gly Asp Glu Tyr Cys Tyr Gly Gly His Thr
 1970 1975 1980
 Asn Glu Asp Asp Ser Asn Phe Ala His Trp Thr Glu Ala Arg Ile Met
 1985 1990 1995 2000
 Leu Asp Asn Ile Asn Met Pro Asn Gly Leu Ile Ala Gln Phe Tyr Gln
 2005 2010 2015
 Pro Glu Arg Glu Lys Val Tyr Thr Met Asp Gly Glu Tyr Arg Leu Arg
 2020 2025 2030
 Gly Glu Glu Arg Lys Asn Phe Leu Glu Leu Leu Arg Thr Ala Asp Leu
 2035 2040 2045
 Pro Val Trp Leu Ala Tyr Lys Val Ala Ala Ala Gly Val Ser Tyr His
 2050 2055 2060
 Asp Arg Arg Trp Cys Phe Asp Gly Pro Arg Thr Asn Thr Ile Leu Glu
 2065 2070 2075 2080
 Asp Asn Asn Glu Val Glu Val Ile Thr Lys Leu Gly Glu Arg Lys Ile
 2085 2090 2095
 Leu Arg Pro Arg Trp Ile Asp Ala Arg Val Tyr Ser Asp His Gln Ala
 2100 2105 2110
 Leu Lys Ala Phe Lys Asp Phe Ala Ser Gly Lys Arg Ser Gln Ile Gly
 2115 2120 2125
 Leu Ile Glu Val Leu Gly Lys Met Pro Glu His Phe Met Gly Lys Thr
 2130 2135 2140

Trp Glu Ala Leu Asp Thr Met Tyr Val Val Ala Thr Ala Glu Lys Gly		
2145	2150	2155 2160
Gly Arg Ala His Arg Met Ala Leu Glu Glu Leu Pro Asp Ala Leu Gln		
	2165	2170 2175
Thr Ile Ala Leu Ile Ala Leu Leu Ser Val Met Thr Met Gly Val Phe		
	2180	2185 2190
Phe Leu Leu Met Gln Arg Lys Gly Ile Gly Lys Ile Gly Leu Gly Gly		
	2195	2200 2205
Ala Val Leu Gly Val Ala Thr Phe Phe Cys Trp Met Ala Glu Val Pro		
	2210	2215 2220
Gly Thr Lys Ile Ala Gly Met Leu Leu Leu Ser Leu Leu Leu Met Ile		
	2225	2230 2235 2240
Val Leu Ile Pro Glu Pro Glu Lys Gln Arg Ser Gln Thr Asp Asn Gln		
	2245	2250 2255
Leu Ala Val Phe Leu Ile Cys Val Met Thr Leu Val Ser Ala Val Ala		
	2260	2265 2270
Ala Asn Glu Met Gly Trp Leu Asp Lys Thr Lys Ser Asp Ile Ser Ser		
	2275	2280 2285
Leu Phe Gly Gln Arg Ile Glu Val Lys Glu Asn Phe Ser Met Gly Glu		
	2290	2295 2300
Phe Leu Leu Asp Leu Arg Pro Ala Thr Ala Trp Ser Leu Tyr Ala Val		
	2305	2310 2315 2320
Thr Thr Ala Val Leu Thr Pro Leu Leu Lys His Leu Ile Thr Ser Asp		
	2325	2330 2335
Tyr Ile Asn Thr Ser Leu Thr Ser Ile Asn Val Gln Ala Ser Ala Leu		
	2340	2345 2350
Phe Thr Leu Ala Arg Gly Phe Pro Phe Val Asp Val Gly Val Ser Ala		
	2355	2360 2365
Leu Leu Leu Ala Ala Gly Cys Trp Gly Gln Val Thr Leu Thr Val Thr		
	2370	2375 2380
Val Thr Ala Ala Thr Leu Leu Phe Cys His Tyr Ala Tyr Met Val Pro		
	2385	2390 2395 2400
Gly Trp Gln Ala Glu Ala Met Arg Ser Ala Gln Arg Arg Thr Ala Ala		
	2405	2410 2415
Gly Ile Met Lys Asn Ala Val Val Asp Gly Ile Val Ala Thr Asp Val		
	2420	2425 2430
Pro Glu Leu Glu Arg Thr Thr Pro Ile Met Gln Lys Lys Val Gly Gln		
	2435	2440 2445

Ile Met Leu Ile Leu Val Ser Leu Ala Ala Val Val Val Asn Pro Ser
 2450 2455 2460
 Val Lys Thr Val Arg Glu Ala Gly Ile Leu Ile Thr Ala Ala Ala Val
 2465 2470 2475 2480
 Thr Leu Trp Glu Asn Gly Ala Ser Ser Val Trp Asn Ala Thr Thr Ala
 2485 2490 2495
 Ile Gly Leu Cys His Ile Met Arg Gly Gly Trp Leu Ser Cys Leu Ser
 2500 2505 2510
 Ile Thr Trp Thr Leu Ile Lys Asn Met Glu Lys Pro Gly Leu Lys Arg
 2515 2520 2525
 Gly Gly Ala Lys Gly Arg Thr Leu Gly Glu Val Trp Lys Glu Arg Leu
 2530 2535 2540
 Asn Gln Met Thr Lys Glu Glu Phe Thr Arg Tyr Arg Lys Glu Ala Ile
 2545 2550 2555 2560
 Ile Glu Val Asp Arg Ser Ala Ala Lys His Ala Arg Lys Glu Gly Asn
 2565 2570 2575
 Val Thr Gly Gly His Pro Val Ser Arg Gly Thr Ala Lys Leu Arg Trp
 2580 2585 2590
 Leu Val Glu Arg Arg Phe Leu Glu Pro Val Gly Lys Val Ile Asp Leu
 2595 2600 2605
 Gly Cys Gly Arg Gly Gly Trp Cys Tyr Tyr Met Ala Thr Gln Lys Arg
 2610 2615 2620
 Val Gln Glu Val Arg Gly Tyr Thr Lys Gly Gly Pro Gly His Glu Glu
 2625 2630 2635 2640
 Pro Gln Leu Val Gln Ser Tyr Gly Trp Asn Ile Val Thr Met Lys Ser
 2645 2650 2655
 Gly Val Asp Val Phe Tyr Arg Pro Ser Glu Cys Cys Asp Thr Leu Leu
 2660 2665 2670
 Cys Asp Ile Gly Glu Ser Ser Ser Ser Ala Glu Val Glu Glu His Arg
 2675 2680 2685
 Thr Ile Arg Val Leu Glu Met Val Glu Asp Trp Leu His Arg Gly Pro
 2690 2695 2700
 Arg Glu Phe Cys Val Lys Val Leu Cys Pro Tyr Met Pro Lys Val Ile
 2705 2710 2715 2720
 Glu Lys Met Glu Leu Leu Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg
 2725 2730 2735
 Asn Pro Leu Ser Arg Asn Ser Thr His Glu Met Tyr Trp Val Ser Arg
 2740 2745 2750

Ala Ser Gly Asn Val Val His Ser Val Asn Met Thr Ser Gln Val Leu
 2755 2760 2765
 Leu Gly Arg Met Glu Lys Arg Thr Trp Lys Gly Pro Gln Tyr Glu Glu
 2770 2775 2780
 Asp Val Asn Leu Gly Ser Gly Thr Arg Ala Val Gly Lys Pro Leu Leu
 2785 2790 2795 2800
 Asn Ser Asp Thr Ser Lys Ile Lys Asn Arg Ile Glu Arg Leu Arg Arg
 2805 2810 2815
 Glu Tyr Ser Ser Thr Trp His His Asp Glu Asn His Pro Tyr Arg Thr
 2820 2825 2830
 Trp Asn Tyr His Gly Ser Tyr Asp Val Lys Pro Thr Gly Ser Ala Ser
 2835 2840 2845
 Ser Leu Val Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp Asp Thr
 2850 2855 2860
 Ile Thr Asn Val Thr Thr Met Ala Met Thr Asp Thr Thr Pro Phe Gly
 2865 2870 2875 2880
 Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Lys Ala Pro Glu Pro
 2885 2890 2895
 Pro Glu Gly Val Lys Tyr Val Leu Asn Glu Thr Thr Asn Trp Leu Trp
 2900 2905 2910
 Ala Phe Leu Ala Arg Glu Lys Arg Pro Arg Met Cys Ser Arg Glu Glu
 2915 2920 2925
 Phe Ile Arg Lys Val Asn Ser Asn Ala Ala Leu Gly Ala Met Phe Glu
 2930 2935 2940
 Glu Gln Asn Gln Trp Arg Ser Ala Arg Glu Ala Val Glu Asp Pro Lys
 2945 2950 2955 2960
 Phe Trp Glu Met Val Asp Glu Glu Arg Glu Ala His Leu Arg Gly Glu
 2965 2970 2975
 Cys His Thr Cys Ile Tyr Asn Met Met Gly Lys Arg Glu Lys Lys Pro
 2980 2985 2990
 Gly Glu Phe Gly Lys Ala Lys Gly Ser Arg Ala Ile Trp Phe Met Trp
 2995 3000 3005
 Leu Gly Ala Arg Phe Leu Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu
 3010 3015 3020
 Asp His Trp Leu Gly Arg Lys Asn Ser Gly Gly Gly Val Glu Gly Leu
 3025 3030 3035 3040
 Gly Leu Gln Lys Leu Gly Tyr Ile Leu Arg Glu Val Gly Thr Arg Pro
 3045 3050 3055

Gly Gly Lys Ile Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
 3060 3065 3070
 Thr Arg Ala Asp Leu Glu Asn Glu Ala Lys Val Leu Glu Leu Leu Asp
 3075 3080 3085
 Gly Glu His Arg Arg Leu Ala Arg Ala Ile Ile Glu Leu Thr Tyr Arg
 3090 3095 3100
 His Lys Val Val Lys Val Met Arg Pro Ala Ala Asp Gly Arg Thr Val
 3105 3110 3115 3120
 Met Asp Val Ile Ser Arg Glu Asp Gln Arg Gly Ser Gly Gln Val Val
 3125 3130 3135
 Thr Tyr Ala Leu Asn Thr Phe Thr Asn Leu Ala Val Gln Leu Val Arg
 3140 3145 3150
 Met Met Glu Gly Glu Gly Val Ile Gly Pro Asp Asp Val Glu Lys Leu
 3155 3160 3165
 Thr Lys Gly Lys Gly Pro Lys Val Arg Thr Trp Leu Phe Glu Asn Gly
 3170 3175 3180
 Glu Glu Arg Leu Ser Arg Met Ala Val Ser Gly Asp Asp Cys Val Val
 3185 3190 3195 3200
 Lys Pro Leu Asp Asp Arg Phe Ala Thr Ser Leu His Phe Leu Asn Ala
 3205 3210 3215
 Met Ser Lys Val Arg Lys Asp Ile Gln Glu Trp Lys Pro Ser Thr Gly
 3220 3225 3230
 Trp Tyr Asp Trp Gln Gln Val Pro Phe Cys Ser Asn His Phe Thr Glu
 3235 3240 3245
 Leu Ile Met Lys Asp Gly Arg Thr Leu Val Val Pro Cys Arg Gly Gln
 3250 3255 3260
 Asp Glu Leu Val Gly Arg Ala Arg Ile Ser Pro Gly Ala Gly Trp Asn
 3265 3270 3275 3280
 Val Arg Asp Thr Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Leu
 3285 3290 3295
 Leu Leu Tyr Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile
 3300 3305 3310
 Cys Ser Ala Val Pro Val Asn Trp Val Pro Thr Gly Arg Thr Thr Trp
 3315 3320 3325
 Ser Ile His Ala Gly Gly Glu Trp Met Thr Thr Glu Asp Met Leu Glu
 3330 3335 3340
 Val Trp Asn Arg Val Trp Ile Glu Glu Asn Glu Trp Met Glu Asp Lys
 3345 3350 3355 3360

<220>
<223> Description of Artificial Sequence: Synthetic primer

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<210> 69
<211> 66
<212> DNA
<213> Artificial Sequence
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```
<400> 69
ggatccatcg atccccgggtt tttatgacta gttaatcacg gccgcttata aagatctaaa 60
atgcat                                         66
```

```
<210> 70
<211> 30
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic primer

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<400> 70
ggctgcaggt attctaaact aggaatagat 30
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<210> 71
 <211> 12
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 71
 aattgcggcc gc

12

<210> 72
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 72
 aaaggatccg ggtaattaa ttagtcac

29

<210> 73
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 73
 aataaagaag ctctaattaa ttaacgagca gata

34

<210> 74
 <211> 41
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 74
 tcgtaatta attagagctt ctttattcta tacttaaaaa g

41

<210> 75
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 75

aaaacccggg atcgattcta gactcgaggg tacctacgat acaaacttaa cggata 56

<210> 76

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 76

ggccgaattc tgaatgttaa atgttatact tt 32

<210> 77

<211> 5004

<212> DNA

<213> Canarypox virus

<220>

<221> CDS

<222> (1864)..(2187)

<400> 77

ctgaaattgt aatttctaca ttagagagaag gttttgatat tgatggtttt aacagaaacg 60
tagaaattat atcaagggat aacattttat atgatatagt tttaaagtgt aagatggaat 120
taaatttcat gtgcacaaga ggcataggag ataaaagcat tttcagactt tgtataatga 180
aggaatatga tcaaataaac aagaatctgt tagttagtta cttggataaa ttaatcgaga 240
cgcgtagataa aatgactatg taccgttatt gcatgaacga tattataaat atagggttctc 300
gtaggagaga actattgact atggcaatga atgttaaagt ttatactttg gatgaagcta 360
taaatatgca ttggaaaaat aatccattta aagaaaggat tcaaatacta caaacctaa 420
gcgataatat gttaactaag cttattctta acgacgcttt aaatatacac aaataaacat 480
aatttttgta taacctaaca aataactaaa acataaaaat aataaaagga aatgtaatat 540
cgtaattatt ttactcagga atgggggttaa atatttatat cacgtgtata tctatactgt 600
tatcgatac tctttacaat tactattacg aatatgcaag agataataag attacgtatt 660
taagagaatc ttgtcatgat aattgggtac gacatagtga taaatgctat ttcgcatcgt 720

```

tacataaagt cagttggaaa gatggatttg acagatgtaa cttaataggt gcaaaaatgt 780
taaataacag cattctatcg gaagatagga taccagttat attatacaaa aatcactggg 840
tggataaaaac agattctgca atattcgtaa aagatgaaga ttactgcgaa tttgtaaact 900
atgacaataa aaagccatth atctcaacga catcgtgtaa ttcttccatg ttttatgtat 960
gtgtttcaga tattatgaga ttactataaa ctttttgtat acttatattc cgtaaactat 1020
attaatcatg aagaaaatga aaaagtatag aagctgttca cgagcgggtg ttgaaaacaa 1080
caaaattata cattcaagat ggcttacata tacgtctgtg aggctatcat ggataatgac 1140
aatgcatctc taaatagggt tttggacaat ggattcgacc ctaacacgga atatggtact 1200
ctacaatctc ctcttgaaat ggctgtaatg ttcaagaata ccgaggctat aaaaatcttg 1260
atgaggtatg gagctaaacc tgtagttact gaatgcacaa cttcttgtct gcatgatgcg 1320
gtgttgagag acgactacaa aatagtgaag gatctgttga agaataacta tgtaaacaat 1380
gttctttaca gcgagggtt tactcctttg tgtttggcag cttaccttaa caaagttaat 1440
ttgggttaaac ttctattggc tcattcggcg gatgtagata tttcaaacac ggatcgggta 1500
actcctctac atatagccgt atcaaataaa aatttaacaa tgggttaaact tctattgaac 1560
aaagtgctg atactgactt gctggataac atgggacgta ctctttaat gatcgctgta 1620
caatctggaa atattgaaat atgtagcaca ctacttaaaa aaaataaaat gtccagaact 1680
gggaaaaaatt gatcttgcca gctgtaattc atggtagaaa agaagtgtc aggctacttt 1740
tcaacaaagg agcagatgta aactacatct ttgaaagaaa tggaaaatca tatactgttt 1800
tggaattgat taaagaaagt tactctgaga cacaaaagag gtagctgaag tggactctc 1860

aaa atg cag aac gat gac tgc gaa gca aga agt aga gaa ata aca ctt 1908
  Met Gln Asn Asp Asp Cys Glu Ala Arg Ser Arg Glu Ile Thr Leu
    1           5           10           15

tat gac ttt ctt agt tgt aga aaa gat aga gat ata atg atg gtc ata 1956
Tyr Asp Phe Leu Ser Cys Arg Lys Asp Arg Asp Ile Met Met Val Ile
          20           25           30

aat aac tct gat att gca agt aaa tgc aat aat aag tta gat tta ttt 2004
Asn Asn Ser Asp Ile Ala Ser Lys Cys Asn Asn Lys Leu Asp Leu Phe
          35           40           45

aaa agg ata gtt aaa aat aga aaa aaa gag tta att tgt agg gtt aaa 2052
Lys Arg Ile Val Lys Asn Arg Lys Lys Glu Leu Ile Cys Arg Val Lys
          50           55           60

ata ata cat aag atc tta aaa ttt ata aat acg cat aat aat aaa aat 2100
Ile Ile His Lys Ile Leu Lys Phe Ile Asn Thr His Asn Asn Lys Asn
          65           70           75

```

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aga tta tac tta tta cct tca gag ata aaa ttt aag ata ttt act tat 2148
Arg Leu Tyr Leu Leu Pro Ser Glu Ile Lys Phe Lys Ile Phe Thr Tyr
  80                      85                      90                      95

tta act tat aaa gat cta aaa tgc ata att tct aaa taa tgaaaaaaag 2197
Leu Thr Tyr Lys Asp Leu Lys Cys Ile Ile Ser Lys
          100                      105

tacatcatga gcaacgcgtt agtatatttt acaatggaga ttaacgctct ataccgttct 2257

atgtttattg attcagatga tgtttttagaa aagaaagtta ttgaatatga aaactttaat 2317

gaagatgaag atgacgacga tgattattgt tgtaaactctg ttttagatga agaagatgac 2377

gcgctaaaagt atactatggg taaaaagtat aagtctatac tactaatggc gacttggtgca 2437

agaagggtata gtatagtga aatgtttgta gattatgatt atgaaaaacc aaataaatca 2497

gatccatatac taaaggtatc tcctttgcac ataatttcac ctattcctag tttagaatac 2557

ttttcattat atttgtttac agctgaagac gaaaaaaata tatcgataat agaagattat 2617

gttaactctg ctaataagat gaaattgaat gagtctgtga taatagctat aatcagagaa 2677

gttctaaaag gaaataaaaa tctaactgat caggatataa aaacattggc tgatgaaatc 2737

aacaaggagg aactgaatat agctaaacta ttgtagata gaggggcca aatgaaattac 2797

aaggatgttt acggttcttc agctctccat agagctgcta ttggtaggaa acaggatatg 2857

ataaagctgt taatcgatca tggagctgat gtaaactcct taactattgc taaagataat 2917

cttattaaaa aaaaataata tcacgttttag taatattaaa atatattaat aactctatta 2977

ctaataactc cagtggatat gaacataata cgaagtttat acattctcat caaaatctta 3037

ttgacatcaa gttgattgt gaaaatgaga ttatgaaatt aaggaataca aaaataggat 3097

gtaagaactt actagaatgt tttatcaata atgatatgaa tacagtatct agggctataa 3157

acaatgaaac gattaaaaat tataaaaatc atttccctat atataatacg ctcatagaaa 3217

aattcatttc tgaaagtata ctaagacacg aattattgga tggagttata aattcttttc 3277

aaggattcaa taataaattg ccttacgaga ttcagtacat tatactggag aatcttaata 3337

accatgaact aaaaaaaatt ttagataata tacattaaaa aggtaaatag atcatctgtt 3397

attataagca aagatgcttg ttgccataa tatacaacag gtatttgttt ttatttttaa 3457

ctacatatatt gatgttcatt ctctttatat agtatacaca gaaaattcat aatccactta 3517

gaatttctag ttatctagtt tttctagaat attgtacttt atttctaata gaatggctct 3577

ccagcctagt aatttattaa tgttagctga tatcttgaaa tcaggatatt ctgctccgtg 3637

aagagaaagt cctccaaagt tgtatatttc catcactttc atggcttcct cttccatag 3697

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tgtcttctat aagctgtcta tatattgtaa acttttctgg ttttatgcat tttaaacatt 3757
 tagcaatctc attttcatca caattaaggc acaaactctaa catggaatgt ctaccataac 3817
 ccaataaggt tttttcattt cctctatctc taatacacac tgttctttcc agactttcaa 3877
 cacgctgcta ttttctattt tattcaagtc catattataa gcgtccttgt tagacacttc 3937
 ataatgtttg cattctggaa tcatcatgtt agatactatt aatttagcta cttctatgtt 3997
 gtcacaaaa gagttgctat ctgtaattac actaagaggt gtatcacctg ataaagaagt 4057
 aatagagaca tctgctctga atttaagcaa tacctcaata acttcttttg aagatgactt 4117
 tgcagctaaa aataatggag ttctctctaa aacatccctt gagtttatat tagccccgta 4177
 actaatgagt agttctgtta tatcttttga atctattgat atattattaa ttacaattgt 4237
 catgctgaca tatatagaca tcataatatg atgaaaaata tgaaaatata agtgcacgtt 4297
 tactgttact atgattgtga tatcgatatg agttctttta taaaagtact gaaatagata 4357
 taatgcagat atgattgata ttttaaaaag ttgaaaaaaa atatgccctg tttacaaata 4417
 ctatttgga atattctgta ataaagtaat agtgatatgt cagtcacgat ggatttgcca 4477
 attgatcata tgagtataga taacataaac gagtataata aaaatggata tactagactc 4537
 tatatagagg tagccatgaa aaaacgtaaa aacgtagata gacttttata tctcggagct 4597
 gatccgaatc tggctagtgt agattcgtat tgtcctcttc atattgctgt taggaatggt 4657
 agttttaaaga taataagatc attggtgaaa tatgggtgcta atataaatca agaatgtcat 4717
 gaaggagata ctgctttgat gatggctata tcattaggta attatacagc atgtaaaaca 4777
 cttctagata acaacgccga tcttaggttaa ttatgttaac tattacggta tagttccgct 4837
 tattagagca atttatatgtg aaaagcctga catagttaga ctgctattag atagaggagc 4897
 taattgcaac cacttaatta caaaaaacgg tagaacctat actgcttttag agagtcttag 4957
 gaattgcttt tttaaagaca attcttcac c attgtcgata ctaatat 5004

<210> 78

<211> 107

<212> PRT

<213> Canarypox virus

<400> 78

Met Gln Asn Asp Asp Cys Glu Ala Arg Ser Arg Glu Ile Thr Leu Tyr
 1 5 10 15

Asp Phe Leu Ser Cys Arg Lys Asp Arg Asp Ile Met Met Val Ile Asn
 20 25 30

Asn Ser Asp Ile Ala Ser Lys Cys Asn Asn Lys Leu Asp Leu Phe Lys
 35 40 45
 Arg Ile Val Lys Asn Arg Lys Lys Glu Leu Ile Cys Arg Val Lys Ile
 50 55 60
 Ile His Lys Ile Leu Lys Phe Ile Asn Thr His Asn Asn Lys Asn Arg
 65 70 75 80
 Leu Tyr Leu Leu Pro Ser Glu Ile Lys Phe Lys Ile Phe Thr Tyr Leu
 85 90 95
 Thr Tyr Lys Asp Leu Lys Cys Ile Ile Ser Lys
 100 105

<210> 79
 <211> 10
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 79
 ggccgaattc 10

<210> 80
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 80
 ccatgcactg attaatcgat atttttccat gggccc 36

<210> 81
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 81
 ggatcccggg tttttatgac tagttaatca cggccg 36

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<220>
<221> CDS
<222> (24) .. (59)
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<400> 82
aaaggatccg ggттааттаа тта gtc atc agg cag ggc gag aac gag act atc 53
                               Val Ile Arg Gln Gly Glu Asn Glu Thr Ile
                               1           5           10

tgc tgc ттааттаатт agagcttctt таттctatac ттааааagtг аааатааата 109
Cys Ser

caaaggттct tgaggгттgt гттaaattга ааgсgаgааа таатсатааа ттатттсатт 169

atcgcgatat ccгттаagtт тgtatcgtag гtaccctcга гtctagaatc gatccccggгt 229

ттt 232

```

```
<210> 83
<211> 12
<212> PRT
<213> Artificial Sequence
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<223> Description of Artificial Sequence: Synthetic VQH6 amplified fragment

<400> 83
Val Ile Arg Gln Gly Glu Asn Glu Thr Ile Cys Ser
1 5 10

```
<210> 84
<211> 14
<212> DNA
<213> Artificial Sequence
```

```
<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide
```

<400> 84
gccgccacca tggg 14

<210> 85
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 85
cccatggtgg cggctgca